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BIOMEDICAL AND BEHAVIORAL SCIENCES
No. 74

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II

27 June 1977

USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 74

This serial publication contains abstracts of articles and news items from USSR and Eastern Europe scientific and technical journals on the specific subjects reflected in the table of contents.

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PART I. BIOMEDICAL SCIENCES
Agrotechnology

USSR

UDC 631.46

INFLUENCE OF STRAW ON SOURCES OF NUTRITION OF AGRICULTURAL PLANTS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 2
Nar/Apr 77 signed to press 1 Nov 76 pp 176-185

MISHUSTIN, YE. N., VERNICHENKO, L. YU., and MILLER, YU. M., Institute of
Microbiology, Academy of Sciences USSR; Agricultural Academy imeni K. A.
Timiryazev, Moscow

[Abstract] Increased accumulation of excess straw is commonly occurring in the grain producing areas of the USSR, where its use in animal husbandry is decreasing as a consequence of the transition to non-straw bedding for maintenance of the stock. This has led to inquiry about its potential as an organic fertilizer. Trials of such straw were carried out over a two-year period, 1974-1975, on the soddy-podzol soil of the Station for Field Crop Cultivation of the Agricultural Academy imeni Timiryazev. Nitrogen nutrient sources included the soil, fertilizer, and straw. The agricultural plants responded non-uniformly to application of straw to the soil. Cereals in dry areas were depressed in the first year, but rice, flooded during growth, was not depressed. Legumes usually increase in yield, and this is attributed to intensification of symbiotic nitrogen fixation. When nitrogen fertilizers are used and the straw is added to the upper layer of the soil beforehand the harvest yield is not substantially decreased even in the first year. Subsequent addition of straw usually has a positive effect on the harvest. In the first year, the straw lowers utilization of mineral nitrogen fertilizers, but intensifies their subsequent action. Straw lowers non-productive losses of nitrogen mineral fertilizers. Tables 8; references 28: 19 Russian, 1 Slovak, 8 Western.

USSR

UDC 636.2

SYSTEMATIZED USE OF BIOLOGICALLY ACTIVE SUBSTANCES IN ANIMAL FEEDING

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 2, 1977 pp 85-92

FOMICHEV, YU. P., candidate of biological sciences, LEVANTIN, D. L., doctor of agricultural sciences, DZYUBA, N. F., candidate of agricultural sciences, All-Union Order of the Red Banner of Labor Institute of Livestock Breeding--VIZh, RADCHENKOV, doctor of biological sciences, BUTROV, YE. V., GOLENKEVICH, YE. K., candidates of biological sciences, All-Union Institute of the Physiology, Biochemistry and Nutrition of Agricultural Animals--VNIIFBiP

[Abstract] Biologically active substances were administered to bulls and steers of the black-pied breed, coordinated with the stage of development of the animal body, up to the age of 14 months, in the following sequence: substances with hypoglycemic or anabolic effect, with estrogenic effect, with

androgenic effect, and finally, with thyreostatic hypoglycemic effect. This regulated the growth intensity and meat productivity and increased the efficiency of fodder assimilation. Tables 6.

USSR

UDC 633.511(479.24)

WILT-RESISTANCE OF COTTON FROM THE UNITED STATES UNDER AZERBAYDZHAN CONDITIONS

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 2, 1977 pp 39-41

TER-AVANESYAN, D. V., doctor of biological sciences, BABAYEV, F. A., doctor of agricultural sciences, and ABDINOV, F. A.

[Abstract] Samples of cotton strains from various regions in the United States were tested in Azarbaydzhan for resistance to wilt under nursery and laboratory conditions. None were completely immune, but the most stable were Stoneville-702 from the central region of the United States, Acala-Q₆ and M-8 Doubled Hope from the far west and Kemp from the southwest. Some of the strains most resistant in the United States were infected under Azerbayd-zhan conditions. It was proven that there is an inverse relationship between the length of the vegetation period and the degree of resistance of the cotton. Tables 2; references 13 (Russian).

USSR

UDC 636.4+65.011.56

HOG-FARM AUTOMATION FOR RAISING AND FEEDING HOGS USING GRANULATED COMBINED FODDER

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 2, 1977 pp 64-77

GAMALITSKIY, V. A., candidate of technical sciences, All-Union Scientific Research Institute of Agriculturation Electrification--VIESKh

[Abstract] Automatic machines have been used to raise and fatten hogs on granulated combined fodder. The productivity of the animals was increased and a better fodder yield obtained. The machines can be used on newly constructed and modernized farms. The machines feature reduced metal consumption, and electrification and automated control reduce the labor-intensiveness. The animals must be grouped systematically by sex and age. Figures 9; tables 3.

USSR

UDC 633.11

NEW SPECIES OF WHEAT, T. JAKUBZINERI

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 2, 1977 pp 41-43

UDACHIN, R. A., and SHAKHMEDOV, I. SH., All-Union Order of Lenin and Order of the Friendship of Peoples Scientific Research Institute of Plant Breeding imeni N. I. Vavilov--VIR

[Abstract] A new species of wheat was discovered at the VIR Central Asia Testing Station in 1970. Among plants of a sample of turgidum wheat brought from Afghanistan in 1924 was one with branching of the spike, of the type of T. Vavilovi Jokuby. In contrast to T. turgidum, in which the daughter branches issue from the base of the spikelet, forming a secondary spike, perpendicular to the first, in T. Vavilovi they originate inside the spikelet between the husks, and the branching occurs along the length, not just at the bottom. Subsequent study showed the unique feature--in each spikelet (right and left)--there were four spikelet husks. This form is given the rank of a species, named *Triticum jakubzinieri* Udacz. et Schachin. Figures 2; references 11: 9 Russian, 2 Western.

USSR

THE USE OF HERBICIDES ON GRASS PLANTINGS FOR FACILITATING SEED CLEANING

Moscow DOKLADY VASKHNIL in Russian No 3, Mar 77 p 10

VADOPALAS, A. I., candidate of agricultural sciences, and GUDINAS, V. I., Deputy Director for Production

[Abstract] An investigation has been conducted, at an experimental field of the Lithuanian Agricultural Academy, on the influence of the 2,4-D and DNOK herbicides upon the yield and quality of Kentucky blue grass seeds. The results obtained in this investigation justified the recommendation that these herbicides be put into use.

USSR

UDC 631.83:631.811.3

PROCESSES OF SUPPLYING SPRING WHEAT WITH POTASSIUM FROM SOIL AND FERTILIZER

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 20 No 11, Nov 76 signed to press 16 Feb 76 pp 1039-1041

IVANOV, S. N., corresponding member, Academy of Sciences BSSR, and ZHARIKOVA, A. M., Belorussian Scientific Research Institute of Soil Science and Agrochemistry

[Abstract] The supply of potassium to plants from the soil and from fertilizers by means of an indicator tracer has not been studied before. A method for utilizing ^{85}Rb as a potassium tracer has recently been developed by the Laboratory of Soil Physicochemistry and Radioactive Isotopes of the Belorussian Scientific Research Institute of Soil Science and Agrochemistry. Research has been conducted during the two-year period of 1974-75, with the use of ^{85}Rb as a potassium tracer, under conditions of vegetation experiments, on the rules governing the supply of potassium to spring wheat with the application of increasing doses of mineral fertilizers on peat-podzolic soils. The experimental results are described. Figures 1; tables 1; references 2 (Russian).

USSR

UDC 633.2.038:631.559

INFLUENCE OF GRASS-STAND UTILIZATION REGIME IS UPON THE PRODUCTIVITY AND FEED QUALITY OF THE GRASS STANDS

Moscow DOKLADY VASKHNIL in Russian No 3, Mar 77 signed to press 1 Jul 76 pp 11-12

KHABIBULLIN, F. KH., candidate of agricultural sciences, Tatar Scientific Research Institute of Agriculture

[Abstract] In an investigation to determine the optimum periods for mowing down grasses of different botanical composition, which provide for maximum productivity of the haying seasons and the pastures, as well as the optimum fodder quality, it was established that under conditions of forest steppe of the Tatar ASSR with intensive fertilizer application and irrigation, as the multiplicity factor of exclusion of the grass stands is increased from 2 to 4, the yield of the air-dry mass decreases. The highest collection of digestible protein and the highest fodder quality is provided by 3-4-fold utilization of the grass stands. Tables 3; references 4 (Russian).

USSR

UDC 631.587+631.55+631.582

WATER CONSUMPTION AND PRODUCTIVITY OF FIELD CROPS IN CROP ROTATION

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 2, 1977 pp 98-105

TURESHEV, O., TITEV, G. M., RYABININA, YE. V., candidates of agricultural sciences; and LANG, I. B., Kazakh Scientific Research Institute of Agriculture imeni V. R. Vil'yams

[Abstract] Productivity and water consumption of sugar beets and winter wheat with various predecessors was studied. The climate at the test farm was continental, with varying temperatures and precipitation. Water regimes were regulated according to the moisture content of the soil and the water consumption was determined for each variant. It was found that the productivity improved and the water consumption was reduced by crop rotation and the proper predecessors, with alfalfa being especially effective. Tables 7.

USSR

UDC 631.17:331.875

DETERMINATION OF THE SERVICE SPHERE FOR AGRICULTURAL PROCESSING ENTERPRISES

Moscow DOKLADY VASKHNIL in Russian No 2, Feb 77 pp 39-41

KOVAL'CHUK, YU. K., candidate of technical sciences, VASKHNIL Department for the Non-Chernozem Zone of the RSFSR

[Abstract] A model for the optimal size and service area of an enterprise involved in the production of animal products. Increases in enterprise capacity expand the service area and the area devoted to feed production. There is thus a trade-off between reduced production costs and increased transportation costs. The first of the 18 formulas presented is for total costs. It is assumed that fields are evenly distributed around the enterprise, that the area is circular. Material processing outlays are divided into two groups: 1) those proportional to output, such as labor, fuel, repair, energy, etc.; 2) amortization. The latter is defined as the value of enterprise fixed capital times amortization deductions for major repairs and renovation. The total cost equation is differentiated and the optimum for R, the radius of enterprise area, is:

$$R_{opt} = 0.2$$

$$\sqrt[3]{\frac{i_s^p}{Y_p TS}}$$

where - i_s^p - amortization costs times fixed capital

TS - cost per ton kilometer

Y_p - yield

For a specific farm TS and Y_p will not vary greatly, and R_{opt} will mainly depend on iP_s . A specific example is presented. Formulas 18; references 2 (Russian).

USSR

UDC 633.63:631.5

EFFECT OF THE THICKNESS OF PLANTING ON PRODUCTIVE AND TECHNOLOGICAL INDICES OF SUGAR BEETS

Frunze IZVESTIYA AKADEMII NAUK KIRGIZSKOY SSR in Russian No 6, 1976 signed to press 14 May 76 pp 65-70

YEFIMENKO, G. A., YAR-MUKHAMEDOV, R. KH., and SHAMBETOV, S. SH., Institute of Biochemistry and Physiology, Academy of Sciences Kirgiz SSR

[Abstract] A four-year study showed that thinning and irregular planting of sugar beets results in decreased sugar content and poor technological indices of the beets. Thinner planting leads to increased content of fibrous biotypes, lower sugar content of the roots, poorer quality of purified syrup and larger amounts of undesirable byproducts. All of this lowers the yield and sugar production. The optimal density of planting for the lower Chuyskaya Valley, assuring high yield crop with satisfactory technological properties, is 73-86,000 plants per hectare. Tables 5; references 14: 13 Russian, 1 Western.

USSR

UDC 581.16.633.33

DEPENDENCE OF THE YIELD AND QUALITY OF FACTORY SEEDS OF THE POLYHYBRID VNIS-5 ON GROWING CONDITIONS

Alma-Ata IZVESTIYA AN KAZAKHSKOY SSR in Russian No 1, Jan/Feb 77 pp 1-5

BIYASHEV, G. Z., PLOKHIKH, V. B., and MUSUL'MANOVA, N. M.

[Abstract] The use of polyhybrids is based on crossings and creates a number of problems. It is necessary to select crossing components in order to synchronize flowering. Some polyploid beets have low reproductive rates because of irregularities in their development. In order to determine optimal conditions for raising crossing components of the VNIS-5, experiments were carried out at the Kazakh State University Agrobiological Station which is 18 kilometers southwest of Alma-Ata. Growing conditions and techniques were the same for all variants of the experiment. The opinion of S. T. Berezhko and other researchers that the ratio of the parental forms is very important in raising productive triploid beets was tested. The variants were as follows:

ratio of parental forms 4:1 (control; 6:1; 1:1; ratio of 4:1 in combination with increased doses of phosphorus ($N_{120} P_{210} K_{120}$ compared to the $N_{120} P_{140} K_{120}$ for the control); ratio of 4:1 with dense stand of tetraploid forms (70x 35); ratio of 4:1 with increased doses of phosphorus and dense planting of tetraploid forms. The best results in improving seed yield and for all basic and economic indicators were produced by the variant with a ratio of 4:1, a four fold increase in plant density and increased phosphorus (yields of 30.4 quintals per hectare in 1974, and 27.4 in 1975); the variant with a ratio of 4:1 and increased P (20.8 q.p.h. in 1974 and 20.3 in 1975); the ratio of 4:1 and increased density (29.3 in 1974 and 26.4 in 1975). The yields for the control were 18.6 q.p.h. in 1974 and 18.1 q.p.h. in 1975. These variants also had the highest germination energy and rate, data on which are presented in a table. Dense planting of tetraploid forms and applications of increased doses of P under irrigated conditions has a positive influence on yields and planting qualities of polyhybrid seeds. Tables 1; references 8 (Russian).

USSR

UDC 51:612.111.3.001.57

A POPULATION MODEL OF THE ERYTHRON SYSTEM

Novosibirsk IZVESTIYA SIBIRSKOVO OTDELENIYA AKADEMII NAUK SSSR in Russian
No 6, Dec 76 signed to press 12 May 74 pp 126-133

DZHANSEITOVA, G. B., DZHANSEITOV, K. K., and KIBARDIN, YU. V., Krasnoyarsk
Agricultural Institute, and Siberian Technological Institute

[Abstract] A mathematical population model of the erythron system is presented and is characterized by a system of quasi-linear differential-differential equations. The model indicates the existence of periodic changes in the numbers of cells in all classes of the erythrocytic series, although the system is characterized by overall stability and is one of the compensatory mechanisms utilized in oxygen regulation. Studies of erythropoietin, the influence of erythrocytic degradation products on erythropoiesis and oxygen deficiency in regulation of erythropoiesis are supported by the model. Figures 2; references 18: 15 Russian, 3 Western.

USSR

UDC 616.13-004.6-036.21:91(47+57)

STUDY OF ATHEROSCLEROSIS IN DIFFERENT GEOGRAPHIC ZONES OF THE SOVIET UNION.
REPORT II. FATTY-ACID COMPOSITION OF LIPIDS IN THE VASCULAR WALL AMONG
UZBEKISTAN RESIDENTS

Moscow KARDIOLOGIYA in Russian No 2, Feb 77 signed to press 17 Jun 75 pp 91-95

APTEKAR', S. G., VIKHERT, A. M., and MININA, A. V., Institute of Cardiology
imeni A. L. Myasnikov, Academy of Medical Sciences USSR, Moscow

[Abstract] Results are presented of research conducted in Uzbekistan (Samar-kand and Tashkent) among inhabitants of Uzbek and Russian nationality. This region was selected due to results of morphological research referring Central Asia to zones with a low level of atherosclerosis. A detailed description is presented for the fatty-acid composition of the esters of cholesterol, triglycerides, and phospholipids in the normal aortic intima and at various stages of atherosclerosis in the indigenous population (Uzbeks) and nonindigenous (Russian) population of Uzbekistan. The most significant changes were revealed in the cholesterol esters. At various stages of atherosclerosis the changes in the fatty acids of cholesterol esters are not identical and depend on the nature of the lesion. The relative content of the oleic acid is usually higher, and that of the linoleic acid is lower in the fat strands and spots than in the unchanged aortic intima. In the atheromatous plaques, on the contrary, the content of the linoleic acid increases, and that of the oleic acid decreases. With increasing age, the linoleic-acid content increases even in the portions of the intima free of atherosclerosis. The relative content of linoleic acid in the triglycerides of the normal intima and

in the atheromatous plaques is higher among the indigenous population of Uzbekistan than among the nonindigenous population. Tables 4; references 12: 6 Russian, 6 Western.

USSR

UDC 547.995.17

CONTEMPORARY DATA ON HEPARIN AND ITS BIOCHEMICAL PROPERTIES

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 83 No 1, Jan/Feb 77 pp 69-85

UL'YANOV, A. M., and LYAPINA, L. A., Biology Faculty of Moscow State University

[Abstract] A detailed survey of the literature on heparin, with extensive attention given to its structure, physical-chemical properties, biosynthesis, distribution in organs and tissues, metabolism, and enzymatic degradation. The relationship between the structure and anticoagulative properties of heparin is analyzed, and heparin-like substances and heparinoids as well as antagonists of heparin are examined. Primary attention is given to Western literature. The sections are: chemical structure of heparin (2.5 pages); electrophoretic and chromatographic properties (.5 pages); relationship between heparin structure and its biological activity (2 pages); biosynthesis of heparin and its tissue sources (1.5 pages); metabolism of heparin and its enzymatic degradation (2 pages); antagonists of heparin (2 pages); and heparinoids and heparin-like substances (1 page). Special attention is given to the works of Bychkov, Kudryashov, Lakin, Cifonelli, Perlin, Stivala, Erlich, Helting, Lindahl, Freeman, and others. Figure 1; references 157: 20 Russian, 137 Western.

DISTRIBUTION OF SELENIUM-75 IN THE BODY OF CHICKEN AND HENS AND ITS EXCRETION

Frunze IZVESTIYA AKADEMII NAUK KIRGIZSKOY SSR in Russian No 6, 1976 signed to press 2 Apr 76 pp 43-49

ODYNETS, R. N., and TOMSKIKH, YU. I., Institute of Biochemistry and Physiology, Academy of Sciences Kirgiz SSR

[Abstract] Five to thirty days old chickens show a more intensive retention and excretion of Se-75 than older birds, indicating greater need for this element. Chickens receiving supplemental sodium selenite may accumulate certain reserves at about the 4th month, when its metabolism becomes less intensive. It is at this time that selenium deficiency disease may show up. Later, the birds adapt to certain surpluses and insufficiencies of this element. Distribution of Se-75 in 4-month old chickens and in hens suffering from acute and chronic selenium toxicosis is reported. Distribution of Se-75 in the body does not differ when intensified feeding is introduced; the level of accumulation changes, however. Excretion of Se-75 occurs via the gastrointestinal tract, and eggs, this excretion process being most intensive immediately after feeding. The accumulation of Se-75 depends on the age, rate of feeding and dosage. Maximum accumulation levels were found in liver, minimum in the muscles. Selenium supply may be determined from the blood levels of Se-75. Tables 4; references 10 (Russian).

Biophysics

USSR

UDC 612.172.4-087+616.12-073.97

A COMPARATIVE ASSESSMENT OF I. T. AKULINICHEV'S SYSTEM AND McFEE'S SYSTEM IN EVALUATION OF THE HEART'S ELECTRICAL FIELD

Moscow KARDIOLOGIYA in Russian No 2, Feb 77 signed to press 30 Dec 75 pp 107-112

MAKOLKIN, V. I., POPOV, A. A., VALYUGIN, V. M., KUPRIYANOV, B. S., MASLOVA, E. M., and STRUCHKOVA, T. YA., Department of Faculty Therapy, First Moscow Medical Institute imeni I. M. Sechenov; Laboratory of Medical Information Systems of the Institute of Cybernetics, Academy of Sciences UkrSSR, Kiev

[Abstract] The principal regularities of the dynamics of the heart's electrical field during the cycle are reflected in a like manner by I. T. Akulinichev's system and that of McFee. The moduli of momentary QRS vectors of 0.01, 0.02, 0.06, and 0.07 sec are close to each other in the two systems, the greatest difference being noted for the vectors of 0.03 and 0.04 sec. The vectors of 0.06 and 0.07 in the McFee system are deflected back to a larger extent than those of the I. T. Akulinichev system. The initial and final QRS vectors in I. T. Akulinichev's system are turned counterclockwise to a greater degree than those in the McFee system. The orientation of the maximum vector of loop T virtually coincides in the two systems. Figures 2; table 1; references 2 (Russian).

USSR

UDC 621.3.095:581.48

FORCE EFFECT OF A HETEROGENEOUS ELECTRICAL FIELD UPON SEEDS

Moscow DOKLADY VASKHNIL in Russian No 3, Mar 77 signed to press 11 Aug 76 pp 31-32

TARUSHKIN, V. I., candidate of technical sciences, Moscow Institute of Agricultural Production Engineers imeni V. P. Goryachkin

[Abstract] In a study of the force effect of a heterogeneous electrical field upon seeds in the immediate vicinity of the electrodes, it is shown that the force action of such a field upon a dielectric (a grain) depends upon the dielectric properties of the medium as well as upon the dielectric constant of the grain. It is thus shown that the direction of action of the ponderomotive force upon the seeds depends upon the dielectric properties of the medium and the seeds. The relationship of the ponderomotive force to the electrical properties of the particle is the principal basis for separation in a heterogeneous electrical field. The theoretical propositions under consideration have been utilized during the development of new methods and technological facilities for the dielectric separation of agricultural crop seeds. Figures 1; references 6 (Russian).

USSR

UDC 631.4(470.31)

EFFICIENT USE AND INCREASED FERTILITY OF SODDY-PODZOLIC SOILS

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 2, 1977 pp 44-49

YEGOROV, V. V., corresponding member of VASKHNIL (All-Union Academy of Agricultural Sciences imeni Lenin), Soil Institute imeni V. V. Dokuchayev

[Abstract] Climatic conditions, although varied, are favorable for agriculture in the soddy-podzolic (non-chernozem) zone, but the soil must be made more productive. Tidal plains in the north must be developed, reclamation carried out in the west, moisture retained in the east and pasture developed in the south. Various fertilizers must be used, run-off and erosion regulated, excess acidity removed, liming carried out, and the humus maintained. Disordered sowing must be reduced. All this must be done as soon as possible. Table 1.

USSR

UDC 581.17:632.11

BIOPHYSICAL METHODS OF ASSESSING THE STATE OF CELL-NUCLEUS GENETIC STRUCTURES AND THE RESISTANCE OF PLANTS TO ENVIRONMENTAL FACTORS

Moscow DOKLADY VASKHNIL in Russian No 3, Mar 77 signed to press 29 Oct 76 pp 40-42

ARKHIPOV, M. V., candidate of biological sciences, and NIKOLENKO, V. F., Agrophysical Scientific Research Institute

[Abstract] Consideration is given to two biophysical methods of assessing the state of plants: at the cell level by the cytospectrophotometry method, and at the level of the complete organism by the photoinduced chemiluminescence method. These methods were developed at the laboratory of the biophysics of plant mutability of the Agrophysical Scientific Research Institute. The potentialities of the cytophotometric method are discussed for assessing the state of the DNP (desoxyribonucleoprotein) in cell ontogenesis during the action of factors of an electromagnetic nature, as well as during study of the molecular-genetic productivity mechanisms of agricultural plants. An assessment of the intervarietal and intravarietal heat resistance of tomatoes, reproduced by various means, has been conducted for the first time by the photoinduced chemiluminescence method. Figures 2; table 1; references 8 (Russian).

CHARACTERISTICS OF SOIL FORMATION IN THE DELTA RIVERS OF THE DESERT ZONE OF KAZAKHSTAN

Alma-Ata IZVESTIYA AN KAZAKHSKOY SSR in Russian No 1, Jan/Feb 77 pp 59-65

KARAZHANOV, K. D.

[Abstract] Delta soils were studied only comparatively recently in the USSR. Literature from 1926 to 1969 is surveyed. The most important are the monographs by V. M. Borovskiy, et al, (1958, 1959) and V. V. Yegorov (1959). These works discovered some characteristics of soil formation in delta zones in the desert. The basic features are the result of hydrologic conditions and the desert climate. The effects of climatic zones on the formation of hydromorphic soils was noted by S. S. Neustruyev in 1930. Delta soils are affected by several antagonistic factors: zonal, and intrazonal (i.e., material brought in from other regions by the river). Rapid changes in mechanical composition of alluvial deposits cause changes in sedimentation. The degree of unity in lithomorphopedogenic processes in various deltas depends upon hydrogeological conditions. Agricultural activities have transformed the soil. In spite of the extremely broad variation in soils there are several basic tendencies in soil formation processes: swamp, meadow, and solonchak (non-structured white alkali soil). A diagram gives the relationship between these tendencies and the following zones: moist subtropical, desert, semi-desert, steppe, taiga-forest. The flooding of interchannel lowlands results in anaerobiosis. I. I. Tomashevskiy (1957) concluded that it is necessary to divide this into relative anaerobiosis and absolute, in the latter the soil is saturated and deprived of oxygen. As a result of anaerobic decomposition of organic substances there is a sharp drop in oxidation-reduction potential (ORP). It fluctuates from 52-168 mv to 445-490 mv, depending on the type of soil. The arid climate and the stagnant waters result in soil salinization. The biological factor is very important and in some areas plays the main role. Figure 1; table 1; references 11 (Russian).

USSR

UDC 597.0/5-11

GROWTH ACCELERATION IN CARP CYPRINUS CARPIO L. BY ION ACTIVATION OF CARBOXYLATION PROCESSES

Moscow VOPROSY IKHTIOLOGII in Russian Vol 17 No 1(102) signed to press 4 May 75 pp 184-188

ROMANENKO, V. D., VESEL'SKIY, S. P., YEVTUSHENKO, N. YU., and TERESHCHENKO, M. I., Institute of Hydrobiology, Academy of Sciences Ukrainian SSR, Kiev

[Abstract] Carbon fixation by tissues of various carp fish organs, effectiveness of carboxylase ion-activators on this process and their effect on indicators of adaptive metabolism in carp were studied. One- and two-year carp were the subjects, kept both in aquaria and experimental natural ponds at the Vasil'kovskiy fish farm in the village of Malaya Soltanovka, Kiev Oblast. Aquaria 165 liters in capacity each housed 11 carp of the same age; carp weight was 6-7 g per individual. The fish were fed granulated combination feed (in percentages: oilseed meal--55, peas--20, barley, wheat and corn--11, wheat bran--10, fish meal--3 and honey--1). To the combination feed were added salts of magnesium, manganese and zinc, and sodium bicarbonate. Control pond fish were given the usual feed, soaked with water first; an experimental pond fish received 0.8 g of the above-mentioned salt mixture per kg of fish bodyweight. Fish housed in the aquaria were given no, some, or all the salt mixtures (four aquaria, respectively). At periods following this diet regimen fish growth indicators, glycogen content in liver and muscle, free amino acid and RNA content (in liver and muscle tissues) and bile acid content in bile were determined. Analyses showed that adding mineral salts plus sodium bicarbonate to combination feeds given to carp accelerated growth 27.2 percent. Figure 1; tables 3; references 11 (Russian).

USSR

UDC 639.2/9

NATURAL REPRODUCTION OF THE PECHORA SALMON SALMO SALAR L. AND THE RATE OF SUSTAINABLE REMOVAL BY FISHERIES

Moscow VOPROSY IKHTIOLOGII in Russian Vol 17 No 1(102), 1977 signed to press 11 Jul 75 pp 170-175

CHISTOBAYEVA, R. YE., State Scientific Research Institute of Lake and River Fisheries--GosNIORKh, Leningrad

[Abstract] Some schools of Pechora salmon confined to tributaries of the Pechora basin reveal differences in reproductive ability. The descent of Pechora salmon young from the Shchugor River occurs mainly at ages of 2+ and 3+ and from the Upper Pechora--at ages 3+ and 4+. The survival rate of the salmon from roe to the downstream-migrant stage in the first case was 0.61 percent and in the second--0.46 percent. The calculated return per spawning

female was six individuals for the Shchugor River and eight individuals for the Upper Pechora. Potential for salmon reproduction in the Pechora River basin is high. The total spawning area of the preserve rivers of the basin is about 250 hectares and the spawning-growing area is about 3500 hectares. The latter area is underused, though the feeding base does not limit the growth of the young. The dispersed concentration of salmon young in the Pechora River is a consequence of not enough producers in the spawning grounds. Ensuring stable numbers of producers requires a reexamination of the operation of the Pechora cross-over and replacement of the percentage ratio of trapping and release of producers for a quantitative ratio. Regardless of the spawning run intensity, each year no fewer than 40,000-50,000 producers must be released to the spawning grounds; this is 50 percent of the optimal mean population of the Pechora salmon. Figures 2; table 1; references 18: 15 Russian, 3 Western.

USSR

UDC 577.472+597+639.3+03

BIOLOGICAL BASIS FOR THE ORGANIZATION OF COMMERCIAL FISHING ON THE KAMYSHLY-BASHSKIY LAKES

Alma-Ata IZVESTIYA AN KAZAKHSKOY SSR in Russian No 1, Jan/Feb 77 pp 31-37

DUKRAVETS, G. M., PICHKILY, L. O., SHARAPOVA, L. I., DYAGILEV, YU. V., SUMBAYEVA, L. N., TAYPAKOV, M. A., and BIRYUKOV, YU. A.

[Abstract] The lakes are located on the right bank of the Syrdar'ya River, 70 kilometers from its mouth. The system consists of Kamyshlybash, the largest, Laykul', Kayazdy, Dzhalanash, and Raym lakes. They are interconnected and receive water from the Syrdar'ya through a canal. They are shrinking: in 1960 total area was 25,500 hectares, in 1970 it was 23,000 hectares, and in 1973, less than 21,000 hectares. Kamyshlybash is the deepest, but in 1973 it was only 9.5 meters deep. The water is highly mineralized and the pH fluctuates from 7.0 to 7.5 and in the spring of 1973 it reached 8.5. Vegetation, primarily reeds, is dense, ranging from 10 to 300 meters wide along the shore, except for Kamyshlybash, which is free of plants. The phytoplankton of the lakes has not been studied before this report. In 1973, Kamyshlybash had 95 taxons of water plants; Laykul' had 53 species, Kayazdy 48 taxons of phytoplankton, Dzhalanash 44. Breakdowns of other elements of flora and fauna are also given. In 1963 there were 18 species of fish, belonging to 7 families. There are many predatory fish, their population increasing to 30% of the total, mainly because of increases in sander population. The system has good commercial fish productivity. During the past 13 years it has amounted to 46 kilograms per hectare, and in the last 5 to 60 kilograms per hectare. However, the qualitative composition has deteriorated. It is advisable to carry out the following fisheries improvement projects: ensure a stable water supply, clean and deepen interlake linkages, construct fish barriers in canals, eliminate predatory, low value, and trash fish; carry out annual fish stocking with carp. These measures should increase fish productivity to 80-90 kilograms per hectare (16,000-18,000 quintals annually). Tables 3.

HYDROMETEOROLOGICAL CORRELATIONS IN THE PRESPAWNING RUN AND TIMING OF SPAWNING OF THE AZOV ANCHOVY *ENGRAULIS ENCRASICHOLUS MAEOTICUS* PUSANOV

Moscow VOPROSY IKHTIOLOGII in Russian Vol 17 No 1(102, 1977 signed to press 17 Mar 75 pp 140-147

BERENBEYM, D. YA., Atlantic Scientific Research Institute of Fisheries and Oceanography--AtlantNIRO, Kaliningrad

[Abstract] Construction of the Kerch hydroelectric complex draws growing attention to the migration of the Azov anchovy. Multiannual data of the Yugrybpromrazvedka and the Azov-Black Sea Scientific Research Institute of Marine Fisheries and Oceanography were statistically analyzed. Usually, during the wintering period, the Azov anchovy lives in the benthic layer, making diurnal vertical migrations. Wintering ends with the Azov anchovy rising to the upper layer and moving steadily to the Azov Sea. In warm springs, the anchovy begins north earlier than in cold springs. A high correlation of dependence was found between dates of appearance of anchovy in the Kerch bay and the mean daily temperature of the water according to the hydrometeorological station of Anap in April. Seventeen years' observations show that the Azov anchovy begins migrating north in close correlation with the mean-March temperature in the Black Sea: the coefficient of correlation is 0.73 at a significance level of 0.01. Figures 3; tables 2; references 10 (Russian).

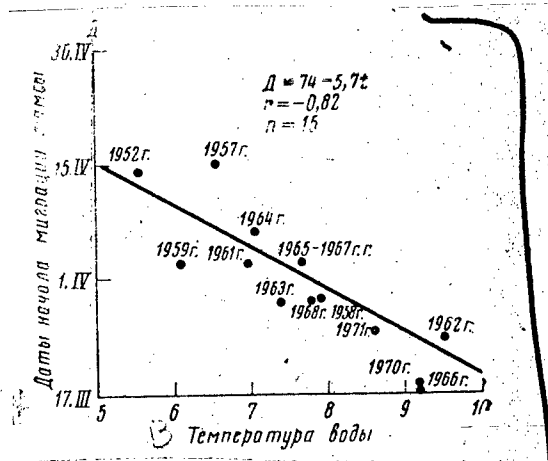


Fig. 2. Correlation of date of start of spring migration of Azov anchovy with mean-March water temperature at the Novorossiysk hydrometeorological station.

Key: A. Dates when Azov anchovy spring migration begins
B. Water temperature

CZECHOSLOVAKIA

UDC 615.452 (INTERFERON 1976):616.988.2-066-097.3

INTERFERON 1976. II. IMPORTANCE OF INTERFERON IN MEDICINE

Bratislava BRATISLAVSKE LEKARSKE LISTY in Slovak Vol 66 No 6, Dec 76 signed to press 12 May 76 pp 645-652

BORECKY, L., Scientific Collegium of the Slovak Academy of Sciences for Biological and Medical Sciences

[Abstract] Interferon shows excellent antiviral effects against RNA, DNA and combined RNA-DNA viruses. A single interferon cell may protect 2500 other cells from an infection by the virus of vesicular stomatitis. Interferon may be considered to be a "general" antiviral drug because of its lack of toxicity and antigenicity. It is, however, strain specific and difficult to prepare in high purities. It is used at present because of its antiviral effect for the protection of patients suffering from tumors and of individuals deprived of immunity, in treatment of acute infections, as an antimitotic drug, as an anti-GVH drug, for inhibition of MLR, for protection from tumors and against effects of X-ray treatment and of chemotherapy. It also can control certain immunologic effects. Figure 1; tables 5; references 91: 10 Czech, 2 Russian, 79 Western.

CZECHOSLOVAKIA

UDC 616.988.25:576.895.421:576.8.097.3:576.858:
616-097.24

EXPERIMENTAL IMMUNIZATION AGAINST TICK-BORNE ENCEPHALITIS BY LIVE ATTENUATED VIRUS: CLINICAL STUDY

Bratislava BRATISLAVSKE LEKARSKE LISTY in Slovak Vol 67 No 2, Feb 77 pp 169-178, manuscript received 5 Jan 76

OROLIN, DANIEL; POGADY, JOZEF; MAYER, VLASTIMIL; BURAN, IVAN; and STAREK, MILOUS, Neurological Clinic, Institute for Postgraduate Training of Physicians and Pharmacists, Bratislava; Laboratory of Experimental Psychiatry, Pezinok; Virological Institute of the Slovak Academy of Sciences, Bratislava; Institute of Serums and Inoculations, Prague

[Abstract] A group of 32 persons immunized by a single dose of an experimental live virus vaccine prepared from highly attenuated virus at the Institute of Virology, of the Slovak Academy of Sciences at Bratislava, was studied. All of the personnel investigated were hospitalized patients at the Pezinok Institute for Experimental Psychiatry. The immunizing dose was 5 - 6.5 Dex. i.c., LD₅₀ (for newborn mice) using attenuated virus E5'14' from the tick-borne encephalitis complex. Clinical neurological examinations, examination of the cerebrospinal fluid, and electroencephalographical studies failed to yield positive evidence of an apparent adverse effect of the immunization on human

organism. Significant formation of specific virus-neutralizing antibodies against tick-borne encephalitis virus was observed. Antibody levels persisted during the whole period of observation of one year in 22 persons, and of two years in 10 persons. Tables 3; references 25: 9 Czech, 2 East German, 14 Western.

USSR

UDC 613.6-07:612.017.1

IMMUNOBIOLOGICAL REACTIVITY OF THE BODY OF WEAVERS UNDER NEW ORGANIZATIONAL FORMS OF WORK

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 77 signed to press 15 Apr 76 pp 36-40

NIKOLAYEVA, YE. N., and YUSHKOVA, O. I., Moscow, First Medical Institute imeni I. M. Sechenov

[Abstract] Introduction of new equipment and new organization of the work routine in the silk weaving industry made it possible to switch over to multiple loom performance. Data are presented on immunobiological bodily resistance of weavers with an established long term work record, operating on as many as 16 looms. No appreciable difference was observed between the study and control groups, nor among the weavers working on different numbers of looms. The bactericidal function of the blood of weavers, as compared to the workers of mechanical departments, was lower. The monotonous microclimate in the weaving departments negates seasonal variation of some aspects of immunologic resistance. Tables 2; figures 2; references 6 (Russian).

USSR

UDC 616.15-073:536.2

A BASIS FOR THE USE OF THERMORESISTORS IN THE STUDY OF IMMUNOBIOLOGICAL REACTIONS

Novosibirsk IZVESTIYA SIBIRSKOVO OTDELENIYA AKADEMII NAUK SSR in Russian No 6, Dec 76 signed to press 10 Dec 75 pp 133-137

KASHAFUTDINOVA, Z. N., and STARIKIN, YU. A., Novosibirsk State Medical Institute

[Abstract] A nonlinear theory of heat exchange between a thermoresistor and surrounding fluid is developed and explained. The valid use of thermoresistors to measure the rate and results of immunity reactions is proposed and based on the theory and on 224 statistically verified experiments with a variety of highly purified antigen and antiserum. References 7 (Russian).

Industrial Microbiology

HUNGARY

A COMPARATIVE STUDY OF THE PROTEOLYTIC EFFECTS OF ENZYME PREPARATIONS

Budapest MAGYAR ALLATORVOSOK LAPJA in Hungarian No 2, 1977 p 95

BOLDIZSAR, H., Dr., Chair of Biology of the University of Veterinary Sciences,
HORVATH, F. M. E., Chair of Biology of the University of Veterinary Sciences,
and STADLER, I., Chinoin Pharmaceutical and Chemical Works

[Abstract] The proteolytic abilities of pronase preparations prepared by fermentation with *Streptomyces fradiae*, *Str. rimosus*, *Str. griseus* and *Bacillus subtilis* and of neutral and alkaline protease preparations were compared, using casein and serum albumin as substrate. The amino-acids formed during the decomposition were determined with the help of an amino-acid analyzer. It was found that the pronase preparation decompose, with good efficiency, the problems used in the experiment, yielding 48.8 to 62.0 percent free amino-acids; the protease preparation of bacterial origin yielded much lesser amounts of amino-acids (e.g., *B. subtilis* alkaline protease: 8.9 per cent). It was concluded that these pronase preparations may be useful for the enzymatic fabrication of fodder proteins. The goal of the experiments was to compare the proteolytic effects of various pronase preparations of Hungarian manufacture and of "*Streptomyces griseus* pronase" fabricated by the company Calbiochem. The results are presented in tabular form. Table 1.

USSR

UDC 577.15.07.152

CONSTITUTIVE SYNTHESIS OF PECTOLYTIC ENZYMES OF *PENICILLIUM DIGITATUM* 24P

Moscow BIOLOGICHESKIYE NAUKI in Russian No 2, 1977 signed to press 15 Jun 76
pp 99-103

LOBANOK, A. G., MIKHAYLOVA, R. V., and ROGATSEVICH, L. I., Institute of Microbiology, Academy of Sciences Belorussian SSR

[Abstract] The authors have studied the effect of the nitrogen source on the biosynthesis of all enzymes of the pectolytic complex of *P. digitatum* 24P and the dependence of the synthesis of the individual enzymes on the values of medium pH. NaNO_3 , NH_4NO_3 , $\text{NH}_4\text{H}_2\text{PO}_4$, and $(\text{NH}_4)_2\text{HPO}_4$ are the best sources of nitrogen for the synthesis of polymethylgalacturonase (PMG) while NaNO_3 and KNO_3 are best for synthesis of pectintranseliminase (PTE). When *P. digitatum* 24P was grown at pH 3.0 the pectolytic complex consisted of PMG. At pH 4.0-5.0 it consisted of PMG and PTE; at 8.0-9.0 PTE and traces of PMG. The desired constitutive synthesis could be produced by automatic maintenance of the pH value and by choice of the appropriate source of nitrogen and carbon in the growth medium. Figures 2; tables 2; references 9: 5 Russian, 1 Rumanian, 3 Western.

USSR

UDC 634.0.863:636.087.24:628.54

DETERMINING THE DEGREE OF ACCUMULATION OF POST-YEAST MASH CONSTITUENTS WHEN MASS IS RECYCLED

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 8, 1976
pp 1-3

TOKAREV, B. I., candidate of engineering sciences, SAVEL'YEV, D. D., engineer, BALASHEVICH, I. I., candidate of engineering sciences, and ZUBER, I. YE., candidate of physical-mathematical sciences

[Abstract] Since the degree of recycling of post-yeast mash cannot be unlimited, it must be regulated as to its effect on mash constituents accumulating in the cultural medium. Examined first is the behavior of the mash constituent not part of the production cycle in any reaction--the inert constituent. Hydrolysate flow (m^3/hr) with given inert constituent concentration and flow of water are the variables in deriving mathematical functions to find the maximum allowable percent of mash recycling and to find, for a given mash percentage, the number of the cycle in which the test substance reaches a concentration inhibiting yeast growth. When the substrate of the post-yeast mash was diluted in the yeast-culturing apparatus, it was determined that there is a rise in the amounts of all substances to the concentration corresponding to the value of the analogous indicator of undiluted media. Further closure of the cycle (when the mash recycling for hydrolysis is

brought to 100 percent) raises the concentrations of all to infinity and to each percent of mash recycling there corresponds a specific equilibrium concentration of each particular substance, whose level is reached at a specific cycle. Figures 2.

USSR

UDC 634.0.863.1.002.3:582.232

HYDROLYTIC DISSOLUTION OF ORGANIC SUBSTANCES WHEN BLUE-GREEN ALGAE ARE HYDROLYZED

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 8, 1976 pp 3-4

STOGNIY, I. P., junior scientific coworker, VOLOSHCHUK, T. P., candidate of chemical sciences, SHCHELOKOVA, I. F., candidate of biological sciences, and KVASNIKOV, YE. I., corresponding member of the Academy of Sciences, Ukrainian SSR, Institute of Microbiology and Virology, Academy of Sciences Ukrainian SSR

[Abstract] In the hydrolysis of blue-green algae with 2 percent hydrochloric acid at 100° C, 77.4 percent of the organic substances of the dry weight of algae enters into solution. These substances differ in composition. So the indicator of the rate of hydrolytic dissolution of organic compounds is not constant and decreases somewhat as the hydrolysis goes on; it averages 0.0086 min⁻¹. Hydrolysates of blue-green algae were shown to be a valuable nutrient media; they have, besides reducing agents, sizable amounts of other organic substances utilized by feed yeasts in culturing. Figures 2; table 1.

USSR

UDC 634.0.863:658.382.3

PERFECTING UNIFIED SAFETY MONITORING SYSTEM IN MICROBIOLOGICAL ENTERPRISES

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 8, 1976 pp 16-18

POPOV, V. S., engineer, Boksitogorsk Biochemical Plant

[Abstract] Introduced Oct 72, the Unified Safety Monitoring System was discussed Jul 76 in Kirishi, Leningrad Oblast. At the Kirishi seminar safety engineering practices at two plants of Glavmikrobioprom, Zaporozh'ye and Kirovsk, were scrutinized. The former plant has adopted the Unified System with fairly good reports, while the latter plant suffers from numerous failings in organizing safe labor practices and compliance with safety rules and regulations. The Unified System was detailed by stages with the example of the Boksitogorsk Biochemical Plant. The first stage of monitoring is the

shift-by-shift check of work station safety for worker and equipment over the entire shift and the entire shop. The shift leader (foreman or machine operator) is responsible here. Stage two (a check every 10 days) brings in the safety engineering committee led by the shop head to check safety conditions, then they enter their findings into a special log (the same log the foreman uses in stage one of the Unified System). The plant's safety engineering services monitors this checking schedule. Conferences are held where no more than two to three (instead of the former seven to eight) questions are raised. The third stage (a monthly check) is the operational meetings run by the plant's chief engineer. Formerly just a few shops were reported on at these meetings, while now each member of the safety engineering committee is assigned a shop to report on.

USSR

UDC 634.0.863:658.382.3

IMPROVING SAFETY AND LABOR HYGIENE AT KROPOTKIN CHEMICAL PLANT

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 8, 1976
p 18

POPUGAYEV, D. M., engineer, Kropotkin Chemical Plant

[Abstract] Processes conducted under pressure in hydrolysis units with fast-action covers at the Kropotkin Chemical Plant often endanger operators. To ensure safety, the plant uses blocking devices for keeping the covers from flying open under intensified pressure. An integrated plan for further improvement of working conditions, safety engineering and prevention of industrial injuries for 1976-1980 was drawn up. The plan looks forward to completion of the shop for boiling off production waste water: its first stage is now ready. This shop's commissioning will stop the possible pollution of Kuban' River with untreated discharges. Also, the department preparing milk of lime plans to store lime dissolved; this will cut down on dust in the air.

USSR

UDC 634.0.863.4:663.14.039.3

EXPERIENCE IN PRESERVING YEAST IN BREWING DEPARTMENT

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 8, 1976
p 21

NORINA, A. YE., chief of the central plant laboratory, Tavda Hydrolysis Plant

[Abstract] Yeast of the genus *Schizosaccharomyces*, used in the alcohol shop of the Tavda Hydrolysis Plant, in contrast to *saccharomycetes*, cannot tolerate well a shortage of nutrients and preservation. For example, its storage time in mash is only 3 days and the increment in 4-5 days is 125 percent; these indicators for *saccharomycetes* are 15 days and 200 percent, respectively. A new method was found to preserve *schizosaccharomycetes* yeast. The storage temperature for wort entering the yeast-culturing vessel was kept at the beginning at 60-70° C, to block infection. Wort for immediate use was brought into the brewing department cooled to the maximum (8-12° C). Air was blown into the culturing tank to speed the reproduction of yeast cells.

USSR

UDC 634.0.863.004.68

RATIONALIZERS OF ARKHANGEL'SK HYDROLYSIS PLANT

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 8,
1976 pp 22-23

CHESNOKOVA, I. V., engineer, Arkhangel'sk Hydrolysis Plant

[Abstract] Of 472 rationalizer's suggestions submitted at the Arkhangel'sk Hydrolysis Plant in the five-year plan period, 337 were acted on: the savings came to 305,300 rubles. Raw materials, supplies, metals, transportation facilities and equipment were economized in the amounts: 90,400, 26,000, 26,400 and 51,400 rubles, respectively. Also, plant rationalizers saved 2564 tons of fuel, 1,500 kW of electric power and 63,500 norm-hours of labor.

USSR

UDC 634.0.863.002.5

OPERATING EXPERIENCE WITH RPU-71 VARIABLE LEVEL FLOW METER

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 8, 1976
pp 23-24

FALEYEV, A. I., OGREL', S. M., and MERZLIKIN, S. A., engineers, Volgograd Bio-chemical Plant

[Abstract] In 1974-1975, at the Volgograd Biochemical Plant workers in the KIPiA [control and measuring instruments and automation equipment] section tested and checked the RPU-71 variable level flow meter; it was developed by VNIIGidroliz. First tests were run in the wort flow of the yeast shop, then the flow meter was used in measuring the volume flow of hydrolysate coming into the neutralization department before passing into the neutralizers. The flow meter was found to have a maximum reduced error ± 1.5 percent. Its operating principle involves measuring the height of a column of liquid in a vessel while the liquid freely flows through an opening in the bottom of the vessel. The flow meter scale is in units of m^3/hr . Any standard instruments fit as level indicators: DM-3583 membrane differential manometer with a secondary instrument or a KSD-3, model 1820, with a pneumatic device and a SCh type frequency adder. Liquid flow is measured at atmospheric pressure, narrowing flow meter applications; the instrument can measure only small flows (to $320 \text{ m}^3/\text{hr}$).

USSR

UDC 634.0.863.661.635.004.4

STORAGE OF PHOSPHORUS-CONTAINING SALTS IN SUSPENSION FORM

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1,
1976 p 28

VYRODOVA, L. P., TIMOFEYEVA, V. I., SAFONOV, YU. K., and VOLOKITIN, V. G.

[Abstract] The Laboratory of Quality Control and Standardization of the All-Union Scientific Research Institute of Hydrolysis studied the technology of storage of certain salts in suspension form developed by VNPO Paper Industry to determine the effect of the duration of storage of superphosphate and ammophos in suspension form on their nutrient content. The superphosphate $\text{Ca}(\text{H}_2\text{PO}_4)_2$ was from the Leningrad Hydrolysis Plant (it contained P_2O_5 - 20 percent, solubility in water 30 percent); the ammophos $\text{NH}_4\text{H}_2\text{PO}_4$ was from the Kadaynskiy Chemical Combine, MRTU 6-08-58-67 (contents of water soluble P_2O_5 - 47 percent, nitrogen - 11 percent). The studies showed that 30 days in high-concentration suspension form did not affect the nutrient content and the concentration of the latter was practically unchanged. Microscopic studies revealed no microflora in the suspensions at the end of a month. Use of this method reduces storage space, eliminates heavy labor and reduces losses of salts. Figures 2; table 1; no references.

USSR

UDC 634.0.863.4:331.876

RESERVES IN ACTION

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1976
pp 5-6

ISKORNEV, N. A., chief of the alcohol shop, Kansk Biochemical Plant

[Abstract] In the last year of the Five-Year Plan the alcohol shop of the collective of the Kansk Biochemical Plant produced 110,000 decaliters of ethyl alcohol and 34 tons of furfural above-plan.

All production increases came from searches for internal reserves. Engineers and technicians and workers of the alcohol shop presented 60 suggestions for increase of production and improvement of work conditions. Change of the framework design of reheaters with the use of their chemical cleaning increased water temperature after reheating from 125-130°C. This means one cooking per shift is conducted on saved steam and produced 200 decaliters of alcohol above the plan in one day, a device for second collection of the fermenting mixture with use of heat of the condensate after the drum driers permitted reduction of loss and increase of temperature of fermenting mixture entering the apparatus department by 2°C; change of design of fermenting tanks of the acid measuring tank improved the work conditions of service personnel greatly.

Monitoring of operation of acid pumps, change of mounting filtering lines and some other suggestions made possible production of up to 2100 kg of PB from cooking instead of the planned 2055 kg.

The collective faces problems: there is need for replacement of obsolete hydrolysis equipment, improvement of water supply, and better ventilation in summer. The plant may produce nearly 800,000 rubles of additional profits yearly.

USSR

UDC 634.0.866/.867:331.876

WE ARE KEEPING OUR WORD

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1976
p 6

ZOLIN, A. N., Dmitriyev, Word Chemistry Combine

[Abstract] The shift working on the output of butylacetate has overfilled its production plan in preparation for the 25th Congress of the CPSU at Dmitriyev Wood Chemistry Combine.

Innovations have improved plant operation, with 27 innovators' suggestions providing an economic impact of 27,586 rubles per year, including: "Steaming Vats with Reclaimed Waste Water" (G. B. Breus) savings of 3344 rubles; "Reduction of Saponification of Ether in Continuous Neutralization Pressure Tanks" (B. D. Shutkins) with savings of 4943 rubles. The Ministry of the Paper and

Pulp Industry awarded the brigade the title "best" and several workers received the title, "best in their profession."

In honor of the 25th Congress of the CPSU the collective assumed the obligation to fulfill the 1975 plan by 28 December and to produce 75 tons of butylacetate above the plan, to maintain high quality, to present six innovations and to fulfill the Five-Year Plan as a whole by 25 November 1975.

All of these commitments were fulfilled.

USSR

UDC 676.163.022.082.2

AN EXPERIMENT IN COMPLEX PROCESSING OF SULFITE LIQUORS

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1976 pp 26-27

RIGANOV, V. P., CHIKISHEV, A. I., and ABRAMOV, S. B., Sokol Cellulose-Paper Combine

[Abstract] Complex processing of sulfite liquors by improvement of technology introduction of new apparatus, reconstruction of existing equipment and mechanization of labor-intensive operations made possible a considerable increase in output volume at sulfite-alcohol plants, reduction of cost and reduction of contamination of industrial effluent.

Diagrams are presented of a hydromechanical foam-dissipator and a mechanical scrubber used in the improved process. Figures 2; table 1.

USSR

UDC 634.0.866/.867:331.876

AMZINSKIY WOOD CHEMISTS PREPARE FOR THE 25TH CONGRESS OF THE COMMUNIST PARTY OF THE SOVIET UNION

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1976 p 5

SELIVERSTOV, N. I., Amzinskiy Wood Chemistry Plant

[Abstract] The Amzinskiy Plant fulfilled their 9th Five-Year Plan ahead of schedule with production of 2.75 million rubles worth of goods above the plan. The volume of output for sale and gross output increased 32 percent and labor productivity increased 38 percent. Savings of new materials and indirect materials reached 32,000 rubles, above-plan profits were 310,000 rubles. Innovators provided savings of 314,000 rubles.

Organizational and technical measures introduced include: a pulverized reducer of viscosity of drilling fluids; columns with sieve plates for washing ethyl alcohol and other non-gelatin fractions from ethylacetate raw material with water; replacement of copper rectification columns, calendars, esterification columns with titanium columns; increase of the number of vertical, continuous acting retorts which increased charcoal production 12 percent; a device for producing fuel charcoal briquets from charcoal wastes, burning highly-polluted industrial wastes in a furnace and biological cleaning of agricultural fecal wastes.

In honor of the 25th Congress of the CPSU, the plant collective assumed the following obligations: to fulfill a 2-month plan for output of gross production and production for sale, in 2 months of the 1st year of the 10th Five-Year Plan to produce 50 tons of charcoal and 50 tons of ethyl acetate above the plan and to mechanize wood unloading operations and introduce innovative suggestions with a general economic effect of 45,000 rubles.

USSR

UDC 634.0.863.5:663.14.039.3

IMPROVEMENT OF THE BIOLOGICAL QUALITY OF HYDROLYSATES BY VAPORIZATION IN A VACUUM

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1976 pp 10-12

GLUSHCHENKO, N. V., KUDRITSKAYA, N. YU., and BOBOREKO, E. A., engineers, All-Union Scientific Research Institute of Hydrolysis

[Abstract] Results of laboratory tests, bench tests and experimental-production tests on improvement of hydrolysates by control in a vacuum and results of growing yeasts on processed substrates with concentrations of RS (sugars) of 3.1-4.6 percent were presented.

A 1.4 vaporization caused reduction of concentration of the inhibitors in the hydrolysate: furfural - 9.8 percent; methylfurfural - 92 percent; paracymol - 65 percent. The high quality of the hydrolysates permitted the processing of them on yeasts without dilution with the initial biomass up to 58 percent of the RS. Figures 2; tables 2; references 4 (Russian).

USSR

UDC 634.0.863.5.002:676-163.022.083

BISULFITE LIQUOR AS RAW MATERIAL FOR YEAST PRODUCTION

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1976
pp 21-22

IVANOVA, V. M., director of the Scientific Research Group, Krasnoyarsk Bio-chemical Plants

[Abstract] Bisulfite liquor with 11.0 percent SO_2 content and diluted with spent liquor (1:1) used for growing yeasts under laboratory conditions at the Krasnoyarsk Paper and Pulp Combine yielded 20-25 percent of total RS during liquor input at 10.5 m^3/hour and a working volume of 70 m^3 , ($D=0.15$). After transition to this method of cooking cellulose, yeast growing was conducted on bisulfite liquor containing SO_2 - 0.08-0.11 percent; RS sugars (after precipitation of reducing non-sugars) 0.5-0.9 percent; pH - 3.2-4.0; acidity (in 1 ml, 0.1 N solution of NaOH to 100 ml of sample 45-75). In 1975 the laboratory continued to improve the quality of bisulfite liquor by scavenging the liquor with air and inversion of the sulfuric acid with preliminary displacement of the sulfur compounds and resultant increase in the quality of the bisulfite liquors. Figure 1; tables 2.

USSR

UDC 634.0.863.5.002:676.163.022.083:663.033

EVAPORATION OF THE AFTER-YEAST BREW IN DIRECT FLOW EVAPORATION APPARATUS

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1977
pp 26-28

SAUKHIN, N. A., GIMASHEVA, R. G., Perm Branch of the NPO Paper Industry and KUKLEV, YU. I., Production-Technological Undertaking "ENERGOBUMPROM"

[Abstract] It has been shown to be possible to evaporate the after-yeast brew of the sulfite-cellulose production in direct flow film type apparatus. Minimal formation of the deposit is noticed, therefore, this method is more advantageous than the counter-current or the mixed method. The temperature of the final evaporation is determined on the basis of the properties of each medium in question. In this process it is mandatory to account for proper conditions of heat transfer due to increased viscosity and formation of the deposit. More studies should be carried out on plants with descending film, rather than with the ascending film. Figures 2; table 1; references 4 (Russian).

USSR

UDC 634.0.866/.867:658.3:301

WE WILL ACHIEVE THE GOALS PLANNED

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1977 pp 15-16

KUDRYASHOV, D. S., Ashin Forest Chemistry Plant

[Abstract] An editorial type briefing. During the Ninth Five-Year Plan the Ashin plant increased its productivity by 28.1%, getting out of the red for the first time in 1975. Political activity increased, resulting in better qualifications of the workers on their jobs. The working, living and resting conditions improved for the workers. For the next Five-Year Plan eleven point objectives have been drafted. The first five are concerned with basic improvements in the production, achievements of high technical level, automation of the production and improvements in the construction work. The other points are concerned with: labor-management improvements, improvements in working conditions, living conditions, alteration of the social and occupational structures in the collective, physical and spiritual development, etc. Several specific examples are discussed with a strong belief expressed that all these goals will be achieved. No tables, figures or references.

USSR

UDC 634.0.863.5:663.14.039.3

MICROFLORA OF YEAST GROWING EQUIPMENT

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1977 pp 17-18

SOLOV'YEVA, L. I., SEKRETAREVA, L. F., and KAZAKEVICH, O. V., engineers, Forestry Biochemical Plant

[Abstract] Investigation of the microflora of yeast generating equipment led to identification of four basic cultures: Les-1, Les-2, Les-3 and Les-4. Les-1 and Les-2 are similar cultures, whose properties resemble those of the strain recommended by the All-Union Scientific Research Institute of Hydrolysis. They contain considerable amounts of protein, they are easily flotated and precipitate quickly during the sedimentation of the brew. Les-3 is the zygomycete of marksiana; it develops spontaneously at the plant under investigation, being very troublesome and undesirable. Les-4 is trichosporon cutaneum--another productive culture similar to Les-1. A recommendation has been made to use Les-1 to maintain stable microflora in the yeast generating equipment. Table 1; no references.

USSR

UDC 634.0.863.5.002:631.878

FATTY ACID COMPOSITION OF YEAST LIPIDS CULTURED ON MIXTURES OF PEAT OXIDATES AND HYDROLYSATE

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1977 pp 8-10

ZALASHKO, M. V., ANDREYEVSKAYA, V. D., and OBRAZTSOVA, N. V., Microbiological Institute, Academy of Sciences Belorussian SSR

[Abstract] The fatty acid composition of lipids synthesized by *Candida* and *Lypomyces* yeasts on peat oxidate and hydrolysate has been studied using various ratios of these substrates. In all cases the saturated acids contained principally palmitic and stearic acids, the unsaturated group consisted of oleic and linoleic acids. In a series of these experiments any one of the acids could appear in considerably predominant quantities; this would be indicative of the possibility that the composition of the lipids could be controlled by altering the composition of the substrate used by the yeasts producing them. Tables 4; references 3 (Russian).

USSR

UDC 634.0.863.5.002

CULTIVATION OF *CANDIDA SCOTTIA* YEASTS ON WOOD PULP HYDROLYSATE DILUTED WITH SPENT CULTURE MEDIUM

Moscow GIDROLIZYNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1977 pp 5-6

BOSENKO, A. M., PETROCHENKO, L. V., PETRASHKEVICH, R. I., and LOBUNOV, V. S., Belorussian Technological Institute, and ZININA, M. A., Bobruysk Hydrolysis Plant

[Abstract] The growth and morphology of *C. scottia* yeasts Tul-6 was studied using recycled culture medium to dilute the glucose nutrient medium and wood pulp hydrolysate. It has been shown that with recycling of up to 50% of the culture medium, the growth of yeasts is actually stimulated. Further addition of this spent culture medium has a detrimental effect. This shows that the yeasts excrete both the growth stimulators and growth retardants into the medium. Metabolic products and components unrelated to this activity alter the morphology of the yeasts. Figures 2; table 1; references 8 (Russian).

USSR

UDC 634.0.863.5:582.288

CULTIVATION OF YEASTS ON GRAPE WASTE HYDROLYSATE

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 1, 1977
pp 6-8

TROITSKIY, A. S., and BARINOVA, N. G., engineers

[Abstract] Hydrolysates from pressed grapes differ considerably from wood pulp hydrolysates by their content of protein, aminoacids, organic acids, phosphorus and nitrogen. *Candida scottia* yeasts utilize as nutrient medium the sugars, volatile acids, and aminoacids from these sources. The non-volatile acids, probably because of the presence of tartaric acid, are not as useful for this purpose. The yield of dry yeasts with high protein content is 100.2% on the hydrolysate from grape cake and 122.5% on one from the combs. The growth rate on these media appeared to be higher. These hydrolysates should be added routinely to the industrial wood pulp hydrolysate to improve their biological quality. The chemical composition of these hydrolysates and of the brew has been reported. Figure 1; tables 4; references 8 (Russian).

USSR

UDC [634.0.863+576.8]:061.3

EXPANDED MEETING OF THE BOARD OF THE MAIN ADMINISTRATION OF THE MICROBIOLOGICAL INDUSTRY AND THE CENTRAL COMMITTEE OF THE TRADE UNION FOR WORKERS IN THE PETROLEUM, CHEMICAL, AND GAS INDUSTRIES

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 7, 1976
pp 29-30

[Abstract] The meeting was held at the end of July 1976. Tasks of scientific research and planning design organizations in the implementation of the Tenth Five-Year Plan were discussed. This calls for further improvements in technological processes, new equipment, the use of new strains of microorganisms, reduction in raw material expenditure per unit of output, and the better use of design capacity. By the end of the Plan, 25% of the sector's output will meet the highest quality categories. It is planned to produce more than 20 types of new products. Scientific achievements will increase the raw protein content of protein vitamin concentrates to 60% and that of feed yeasts to 54%. Automated management and control systems will be put into operation and a sector automated control system will be completed. More than 70% of the increase in the production of feed yeasts, antibiotics, plant protection products, and 30% of the increase in enzymes will be attained through production intensification and modernization of existing enterprises. Institutes should work towards basically new processes of obtaining microbiological products and towards their more extensive use. Study areas should be refined, work which is not promising and which does not seem technically or economically feasible should be eliminated. Deadlines for scientific research work should

be shortened, and the research-production process should also be shortened. Beginning in 1978 all major scientific research and experimental industrial work should be converted to program-objective planning. During the first quarter of 1977, planning institutes should examine and verify technical decisions made in construction plans in order to make maximum use of experience. Economic research should be expanded. Institutes will receive modern equipment.

USSR

UDC 634.0.863.1.676.16.022.168:66.065.8

EFFECTIVE DIRECTION IN THE DEVELOPMENT OF THE PRODUCTION OF SOLID WASTE LIQUOR CONCENTRATES

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 7, 1976 pp 27-29

VOLOVIK, M. I., engineer, State Institute for Planning of Establishments of the Wood Chemistry Industry

[Abstract] The lignosulphins in sulphite yeast fermenting mixtures are very harmful to the environment. Some enterprises have begun to utilize them. In most cases this means the production of liquid waste liquor concentrates (LWLC) containing 50-56% moisture and having an intraindustry wholesale price of 9-15 rubles per ton. Production costs are only partially covered. It is advisable to examine the possibility of producing solid waste liquor concentrates (SWLC) using processes and equipment which have already been developed. In spite of the increasing demand for SWLC, production has not expanded. They are only produced, in the form of large chunks, at the Sokol'sk and Sukhonskiy cellulose paper combines, where they are evaporated to 30% absolute dry substance. Kestner type equipment is used in this process. Tables present indicators for Kestner apparatus operation and compare it to vacuum evaporator installations and plate driers. The Kestner apparatus has considerably better indicators for total weight, fuel expenditure, capital investment per unit capacity, prime cost for the evaporation of 1 ton of moisture (72-88 rubles for Kestner, 82-118 for vacuum evaporation, 140-220 rubles for plate driers). Packing the product in bags involves many difficulties: breakage, excessive cooling time, excessive costs (up to 15% of total cost of SWLC). The Bashkir plant for tanning extracts uses the Kestner equipment but has also introduced additional evaporation columns, drying the extract to 90% content of dry substances. The extract is poured onto a moving belt and further hardened and then ground into a powder. This has resulted in more efficient production of SWLC. At the majority of enterprises it is possible to set the cost of SWLC at 55-70 rubles per ton, when transport costs and utilization efficiency are taken into consideration the intraindustry wholesale price could be set at 100 rubles per ton of dry substances, the price for 90% SWLC has been set at 125 rubles. A table compares two production variants: liquid and solid. The latter is superior with respect to economic indicators. This is due to the much lower price for liquid waste liquor concentrates, 15 rubles per ton, in

comparison to solid, 75 rubles per ton. In order to rapidly organize this type of production it is necessary to construct experimental-production installations at Sokol'skiy and Kaliningrad and to produce experimental batches of the new product as well as to develop appropriate technological rules and conditions for production. Experimental and computational data thus indicate the technical potential and economic advisability of producing SWLC in the form of powder. Production will expand its use. It is possible to make sulphite yeast fermenting mixture production profitable. Tables 4; no references.

USSR

UDC 634.0.863:65.011.56

CONVERSION OF CONTROL AND MANAGEMENT SYSTEM TO STANDARDIZED INSTRUMENTS

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 7, pp 21-22

SEVAST'YANOV, V. V., Arkhangelsk Hydrolysis Plant

[Abstract] The KIPiA [Control-measurement instrument and automation] service at the Arkhangelsk Hydrolysis Plant is partially automating processes in the digester, rectification, and furfural sections and the yeast shop, installing pneumatic instruments from the "Start" system. The system is reliable and simple to operate and has great functional potential. It will carry out diverse tasks, from the control of one parameter to the integrated, interlinked automation of complex processes. When the plant was closed down in June 1976 for major repairs the sections were converted to the new equipment. The second area of application is the regulation of the thermal electric station and the water purification station. Further improvement of work requires: organization and operation of the KIPiA service in accordance with directives ratified in 1973 which require special attention towards meeting state standard GOST 8.002-71; all equipment is to be capable of automatic operation. The plant does not have enough KS-3 instruments. Annual allocations only supply 15-20% of its needs. Because of the lack of an exchange stock of instruments, these devices are not available at times (when they are sent away for state inspections). The Administration of the Hydrolysis Industry should assist in remedying this situation.

PLATE CONDENSORS IN THREE STAGE LAYOUT FOR HEAT UTILIZATION

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 7, 1976 pp 11-12

KEDROV, M. S., senior scientist, TOVAZHNYANSKIY, L. L., YASTREBENETSKIY, A. R., docents and TSYBYL'NIK, V. A., senior instructor, Kharkov Polytechnical Institute imeni V. I. Lenin

[Abstract] Plate condensers are now used in the construction of new and the reconstruction of existing chemical and biochemical factories. However, experience in the operation of these condensers is not sufficient to allow designers to use all their potential. As a result they do not always handle their planned loads. Such was the case at the Bel'tsiy Biochemical Plant, where two plate reheaters with an area of 100 square meters each were installed for the IIInd stage. There were several important shortcomings in the design. The heat exchange area was considerably overestimated. The design did not take the specific conditions of water supply at the Bel'tsiy plant into consideration, especially the high salt content. The lines had to be cleaned every 8-10 days. Shortcomings in the reheater operation sharply reduced technical-economic indicators. Following the suggestions of the Khar'kov Polytechnic Institute imeni V. I. Lenin the reheater was redesigned. A layout of the redesigned system consists of two tube reheaters in the 1st, 6 plate reheaters, 4 of which have been redesigned and 2 of which were not, pumps and collection tanks. The new system's coefficient of heat transfer has practically no variations during time of operation. Operation of the reheater has proven the validity of the redesign. The reduced pressure in the evaporators has helped in more completely extracting furfural from the hydrolyzate, increasing plant capacity by 50% over previous plans. The greater hydrolyzate heat utilization is the most important result. When operating close to design loads the temperature at the outlet is raised to 100-115 degrees. This has reduced steam use during hydrolysis by more than 11,000 Gigacalories annually. The reheaters have operated for over 10 months without stop for repairs, and have saved more than 1,500 deficit resin packings per year. Figures 3; tables 3; no references.

USSR

UDC 634.0.863.5.002.5.65.011.56

AUTOMATIC METHOD OF MAINTAINING A CONSTANT LEVEL IN A TANK IN ORDER TO BLOW AIR THROUGH NEUTRALISATE

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 7, p 10

FRIDMAN, M. S., OYF, A. N., FINKEL', A. I., VULIKHMAN, V. A., and MALKIS, L. D., engineers, Southern Institute for Planning of Biosynthesis

[Abstract] Yeast production operations using agricultural raw materials clarify neutralisate and send it through a heat exchanger. The colloids formed require large amounts of air. A method for oxidation by blowing air through a tank was suggested by N. V. Glushchenko (Podgotovka Substratov [Preparation of Substrates] 1972). The air supply to this apparatus must be kept at a constant level. The method which has been suggested and patented (Soviet Avt. svid No. 449092 of 12.07.74) is outlined in a flow chart and diagram. The functional system for the automation of the process of improving the quality of neutralisate is as follows: 1. vacuum cooling installation; 2. tank for air blowing; 3. flow gauge, 5-6. flow regulators; 7-8. regulating equipment; 9. level gauge; 10. multiplier; 11. adder.; 12. controller; 13. regulator. The flow of neutralisate entering the vacuum cooler depends on the flow of neutralisate and on the signal "h" proportional to the level in the tank. This is attained by stabilizing the level in the lower part of the vacuum cooler independently of the level in the tank, which, in its turn is maintained to ensure the necessary time for colloid cooling. The following instruments from the "Start" pneumatic system are used: PR3.21, PF1.9, PF1.1, PV10.1E. Figures 1; no references.

USSR

UDC 634.0.863.5.002.001.2

OPTIMIZATION OF THE PROCESS OF CULTIVATING FEED YEASTS

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 7, 1976 pp 6-8

LITVIN, E. I., BALASHEVICH, I. I., senior scientists, SAVEL'YEV, D. D., deputy chief of laboratories, and TOKAREV, B. I., candidate of technical sciences

[Abstract] The problems of constructing mathematical models of the yeast cultivation process include; its multiparameter nature, the influence and interaction of the factors have been insufficiently studied, experiments are not easily reproducible, microbiological systems are non-homogeneous and change through time, their adaptive systems have not been well studied. A combination of experimental and mathematical approaches is the most promising. The development of information sources is a very important facet of this work. The use of equations for chemical reaction kinetics cannot completely solve the problem since they do not take the activity of the microorganism

into consideration. Several formulas for describing the dependence of microorganism growth on the oxygen and air supply are presented. They permit the optimization of the use of air for aerating the medium and the obtaining of information on the intensity of the process. Similar information can be obtained on increase in concentration of the biomass per unit of time. This, however, presents some difficulty: it does not take into consideration the physiological condition of the microorganisms, periodic changes in substrate delivery causes problems in production, the method cannot be used for operational control of the process. Optimizing the biosynthesis process should be linked to its maximum advisable intensity, taking into consideration the degree of substrate utilization. In most cases the criteria of optimization involve economic characteristics. The objective function for yeast production expresses profit as a function of price minus cost. The maximization of the objective function requires: the best use of the substrate, optimal intensity of the process, automatic changes in the supply of the substrate depending on changes in air supply. The growth of the culture is subject to constraints caused by limited availability of certain nutritive elements. The main indicators are: volume of culture medium, temperature, concentration of hydrogen ions, aeration, use and concentration of substrate. The aeration of the medium is optimized by maintaining a concentration of soluble oxygen somewhat exceeding the critical level for the strain being grown. The optimum level of aeration for a given strain can differ, depending on the concentration of yeast and speed of growth, which in its turn can depend on many factors. As the maximum speed of oxygen diffusion depends on equipment design, maximum productivity requires cultivation under conditions characterized by limited oxygen. The process should, however, occur near conditions where it is limited by substrate. The economically advisable productivity of the apparatus requires supplying substrate with consideration given to the degree of its use. These conditions must be kept in mind when developing algorithms for process optimization. Figures 3; formulas 6; references 7 (Russian).

ON THE OPTIMIZATION OF THE PROCESS OF GROWING A PURE CULTURE OF YEAST

Moscow GIDROLIZNAYA I LESOKHIMICHESKAYA PROMYSHLENNOST' in Russian No 7, 1976
pp 9-10

KALENDRO, YE. L., engineer, TREGUB, V. G., candidate of technical sciences, IVANOVA, L. A., engineer, ONISHCHENKO, V. I., and SAGAN, N. A., students, Kiev Technological Institute of the Food Industry

[Abstract] An algorithm has been developed for planning the optimal coefficient of dilution corresponding to the maximum concentration of active biomass. It was tested in the extraction of a pure culture at the Kirov Biochemical Plant, using IV stage equipment with a total volume of 320 cubic meters. The dependence of the concentration of the active biomass $X_{a,b}$ on the coefficient D was determined. The same basic indicators (pH, temperature and volume of medium, use of wort and water in the apparatus) were maintained for the new algorithm and the traditional control method. Measurements were made at two hour intervals. There were two series of experiments: with constant extraction of the yeast suspension from the apparatus, and with changes in extraction rates simulating problems in coordinating productivity of the pure culture with that of the yeast extraction depending on yeast biomass. The results are presented in a diagram showing the dependence of $X_{a,b}$ on D , the use of suspension Q , medium volume V , content of reducing substances RV , pH and temperature of the yeast suspension. The reduction in the average concentration of active biomass in the third stage resulted from the fact that D exceed its critical value. The reliability of the results were checked with the help of Fisher's F criterion (for difference between the dispersions). The computed value of Fisher's criterion exceeded its table value (1.48). The reduction in the dispersion using the algorithm is statistically reliable. The average biomass concentration was increased by 8.4% and the variation in this magnitude was reduced by 62% indicating more stable operation. Figures 1; tables 1; references 2 (Russian).

USSR

UDC 616.36-003.826-099-092.18:612.351.11

EFFECT OF POLYCYCLIC HYDROCARBONS ON THE ULTRASTRUCTURE AND ENZYMATIC PROPERTIES OF HEPATOCYTES OF RATS POISONED WITH CARBON TETRACHLORIDE

Kiev DOPOVIDI AKADEMII NAUK UKRAYNSKOY SSR. SERIYA B in Ukrainian No 1, Jan 77 signed to press 25 Mar 76 pp 66-69

GUBSKIY, YU. I., SIL'CHENKO, V. P., and POKRASEN, N. M., Kiev Medical Institute; Kiev Scientific Research Institute of Clinical and Experimental Surgery

[Text-English language abstract supplied by authors] Histochemical, ultrastructural and biochemical changes in the rat liver were studied 2 and 20 hours after poisoning with CCl_4 against a background of the preliminary (20 hr before) introduction of polycyclic hydrocarbons of 3-methylcholanthrene and dibenz(a,h)anthracene. Administration of polycyclic hydrocarbons is shown to strengthen the destructive effect of CCl_4 on the liver: the changes in the liver architectonics and hepatocytes ultrastructure become more serious, the quantity of necroses increases, and hepatotoxic effect with 3-methylcholanthrene and dibenz(a,h)anthracene might be connected with activation of the biosynthesis of microsomal cytochrom P-448 that results in highly toxic metabolites of CCl_4 (the type of CCl_3 free radical). Figures 4; table 1; references 13: 7 Russian, 6 Western.

USSR

UDC 616.24-003.662 + 616.233-003.66]-06:616.12-008.46-036.4

DIAGNOSIS OF INITIAL CARDIAC INSUFFICIENCY IN SILICOSIS AND CHRONIC DUST BRONCHITIS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 77 signed to press 16 Apr 76 pp 19-23

GLOTOVA, K. V., SMIRNOVA, M. I., and OGANESYAN, L. T., Institute of Labor Hygiene and Occupational Diseases, Moscow

[Abstract] Radiography with I^{131} tagged human serum albumin was used in the study of the pertinent hemodynamics. A total of 65 patients with silicosis and dust-induced bronchitis were examined and 48 of them showed signs of chronic cor pulmonale. Diagnosis of initial cardiac insufficiency with chronic cor pulmonale requires a complex evaluation of several hemodynamic indices. One of the signs pointing to decompensated circulation is a reduced cardiac stroke index with normal or increased volume of the circulating blood combined with a drop in the circulation effectiveness coefficient and of the intrasystolic index, diminished cardiac output, and slower circulation time in the venous length--from the arm to the heart. Table 1; references 12: 10 Russian, 2 Western.

USSR

UDC 612.24-002.2-003.6-07

PROBLEM OF CHRONIC DUST BRONCHITIS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 77 signed to press 29 Mar 76 pp 15-19

VOLKOVA, V. M., Institute of Labor Hygiene and Occupational Diseases, Krivoy Rog

[Abstract] Many aspects of dust-induced bronchitis remain controversial and obscure. Based on a long experience in examining the miners, in diagnosis and clinical evaluation of dust-induced bronchitis and as a result of a thorough review of pertinent literature, the author raises the following issues: the need for unification of the epidemiological investigations aimed at identification of chronic dust-induced bronchitis, the need for adaptation of uniform terminology and classification in grading dust-induced bronchitis according to the degree of severity, and further search for specific etiologic factors. A workshop on this subject would seem to be in order. No tables or figures; references 25 (Russian).

USSR

UDC 616.634.95:547.313.2]-092.9

URINARY EXCRETION OF ETHYLENIMINE AND ITS METABOLITE MONOETHANOLAMINE UNDER EXPERIMENTAL CONDITIONS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 77 signed to press 29 Sep 76 pp 10-14

SANOTSKIY, I. V., MURAV'YEVA, S. I., ZAYEVA, G. N., and SEMILETKINA, N. N., Institute of Labor Hygiene and Occupational Diseases, Academy of Medical Sciences USSR, Moscow

[Abstract] Ethylenimine (EI) is metabolized in the organism forming a less toxic metabolite--monoethanolamine (MEA). Depending on the level of activity, different excretions of EI and MEA in urine have been noted: with a 1/20 LD₅₀ dose the content of EI is about the same as that of MEA; at levels exceeding 1/20 LD₅₀ the EI level exceeded that of MEA and at levels below 1/20 LD₅₀ the reverse held true. A relationship has been established between the metabolic and functional indices of the poisoning: 50% metabolism of EI and MEA corresponds to a threshold level of toxic effect; excretion of less than 50% of MEA indicates toxic levels, while excretion of more than 50% MEA indicates subthreshold levels. Determination of the metabolism intensity could be used as a novel criterion for estimation of the levels of the effect of metabolites, and the determination of their harmful effect. Figures 3; table 1; references 4: 1 Russian, 3 Western.

USSR

UDC 615.916:546.815].036.12+616-099:546.815]-057-036.12-08

TREATMENT OF CHRONIC LEAD POISONING

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 77 signed to press 24 Mar 76 pp 7-10

LOMOVA, A. A., TRET'YAK, L. F., VOYNAR, R. A., GARINA, YU. G., GRESHCHENKO, L. A., and TALAKIN, YU. N., Donetsk Medical Institute imeni M. Gor'kiy, Oblast' Hospital for Occupational Diseases

[Abstract] Urinary porphyrin content should be determined in routine examinations of workers exposed to high concentrations of lead, far exceeding the permissible levels, in attempts to diagnose lead poisoning. Determination of just the lead levels is not satisfactory, because this level is up in all workers regardless of the development of toxic processes. To treat chronic lead poisoning it is recommended to use IV injection of 10% tetacinum (pentacin) in conjunction with a "B" group vitamin course with addition of iron lactate, ascorbic acid or eleuterococcus under clinical as well as under outpatient situations. The use of unithiol is not justified and D-penicillamine could only be used as a prophylactic measure or in conjunction with a tectacinum (pentacin) course. These agents may also be used in conjunction with limited occupational exposure: 1-2 three day work cycle with a 3-4 day hiatus. No tables or figures; references 10: 3 Russian, 7 Western.

USSR

UDC 616.8-099-02:615.285.7]-036.8

LATE AFTER EFFECTS OF NERVOUS SYSTEM PATHOLOGY INDUCED BY THE ACTION OF LOW CONCENTRATIONS OF ETHYLMERCURIC CHLORIDE

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 77 signed to press 18 Nov 76 pp 4-7

MUKHTAROVA, N. D., Institute of the Hygiene and Toxicology of Pesticides, Polymers and Plastics, Kiev

[Abstract] Prolonged intake (2-3 months) of small doses of ethylmercuric chloride (EMC) with meat and milk products may lead to a pathological state of the nervous system in about 1.5 to 3 years after exposure to this agent. The neurotoxic process shows the following characteristics during the late periods: a stable change in the function of the sympatho-adrenal system in the direction of depression of both aspects, vascular pathology in the brain of a transitory type affecting the brain's blood circulation, and changes in the nervous system affecting principally the hypothalamic structures manifested by neuroendocrinologic and vegetative-vascular forms. Intensification of nervous system pathology, especially mental disturbances, occurred in individuals who received no therapy, were heavy smokers, and consumed excessive quantities of alcohol. Assay of the daily excretion of catecholamines and electroencephalographic studies are recommended in the differential diagnosis of this state. Tables 2; references 7 (Russian).

USSR

UDC 613.632.4:547.533]:655.35

HEALTH STATUS AND SOME PROBLEMS CONCERNING TOLUENE METABOLISM IN WORKERS OF THE DEEP PRINTING DEPARTMENTS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 77 signed to press 20 May 76 pp 1-4

ARKHIPOVA, O. G., GUBINA, N. B., GRIBOVA, I. A., ZORINA, L. A., LYADOVA, YE. V., MEL'NIKOVA, M. M., POPOVA, T. B., and SOROKINA, N. S., Moscow Institute of Labor Hygiene and Occupational Diseases, Academy of Medical Sciences USSR; Central Institute for the Advanced Training of Physicians

[Abstract] Clinical-hygienic study of workers exposed to toluene showed an absence of any intoxication signs in cases of intermittent action (average concentration 375.7 mg/m³). The hematologic changes noted (reticulocytosis, tendency towards erythrocytopenia and thrombocytosis) never reached the level of pathological reactions, they did not intensify with extended exposure and evidently had an adaptive character; no accumulation of the toxic agent was noted in the body. The study of circulation and excretion processes of toluene in industrial workers permitted a quantitative characterization of some aspects of toluene metabolism. No figures or tables; references 6: 1 Russian, 5 Western.

USSR

UDC 628.19:576.8

THERMOPHILIC NITRIFICATION PROCESS IN THE VAPOR-CONDENSATE PIPELINE OF THE MINST TRACTOR PLANT

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol XXI No 3, Mar 77 signed to press 19 May 76 pp 279-282

ZIMENKO, T. G., PROKASOV, G. F., FILIMONOVA, T. V., and GUZYAYEVA, N. N., Institute of Microbiology, Academy of Sciences BSSR

[Abstract] In the process of cleaning filters of steam condensate pipes, concentrations of nitrites up to 1,000-1,500 micrograms per liter were found. This exceeds state standards. Quantitative analysis of nitrites, nitrates, ammonia, and oil, and pH testing were conducted in order to determine the site of the nitrite contamination. Steam condensate and material scraped from the mechanical and coal filters was placed on agar preparations to determine the microflora. The microflora was studied by microscope. Analysis proved a biological origin of the nitrites. The temperature of the condensate (60 degrees C) is conducive to the development of thermophilic and thermotolerant microorganisms. Microscopic investigations indicated that the cells were rod shaped and elongated and 0.7-0.8 x 1.0-1.6 microns in size, somewhat smaller than nitrifying microorganisms. This was probably due to their adaptation to high temperatures. The diverse nature of the flora creates difficulties in taking measures against them. In addition, the use of

chemical treatment is hindered by the necessity of maintaining water quality standards in the production process. A method of fighting the process through the use of direct current electrical fields has been developed. Figure 1; tables 3; references 13 (Russian).

USSR

HYGIENIC EVALUATION OF THE EFFECTIVENESS OF NEW AERATION PATTERNS IN THE MAIN BLOCK BUILDING OF A LARGE HYDROELECTRIC PLANT

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA (Industrial Hygiene and Professional Diseases) in Russian No 3, Mar 77 signed to press 13 Apr 76 pp 43-46

PAL'TSEV, YU. P., TSIRKOVA, N. L., KAPAROVICH, I. G., (Moscow), ROMANOVA, T. M., USHAKOV, G. A., and MOSHKARIN, A. V., (Ivanovo), Institute of Hygiene imeni F. F. Erisman; Institute of Energy imeni V. I. Lenin

[Abstract] Considerable attention is being paid at the thermal electric plants of USSR to environmental microclimate. In spite of the improvements of working conditions resulting from automation of many operations, a considerable number of mechanics and repairmen are still exposed to overheated working conditions, to excessive concentrations of toxic gases, etc. A schematic design has been proposed for proper air supply which would normalize the surrounding air in the working zone. Figures 3; tables 2; no references.

USSR

UDC 615.957'582.4-053

CHARACTERISTIC BODILY REACTIONS OF ANIMALS OF DIFFERENT AGE TOWARDS SINGLE AND CHRONIC ACTION OF BENZONITRILE

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 77 signed to press 27 Oct 75 pp 40-42

AGAYEV, F. B., ALEKPEROV, I. I., and PAVLOVA, L. P., Sumgait, Azerbaydzhan Institute of Labor Hygiene and Occupational Diseases imeni M. M. Efendi-Zade

[Abstract] Age-specific reactions of the rat body to the action of benzonitrile were investigated in acute and chronic experiments. No significant differences were found which could be related to age. Chronic benzonitrile poisoning was manifested by functional disorders of the CNS, liver, by changes in morphological composition of peripheral blood, and by changes in tissue redox processes. The qualitative changes observed could be due to age characteristics as well as to specific action of a given toxic agent. Tables 2; no figures or references.

Microbiology

HUNGARY

IN VITRO EFFICACY OF SOME SULFONAMIDES AND SULFOAMIDE POTENTIATING COMPOUNDS AND OF THEIR COMBINATIONS

Budapest MAGYAR ALLATORVOSOK LAPJA No 2 signed to press 12 Jun 76 pp 127-129

SUEVEGES, T., and TOTH, I.

[Text-English language abstract supplied by authors] The efficacy of sulfaquinoxaline and sulfadimethoxine as well as of trimetoprim, ormetoprim and diaveridine and their 1:5 and 1:3 combinations was studied in synthetic media by the broth dilution method. Their inhibitory effect on the growth of 15 bacteria were determined. The most marked inhibitory effect on Salmonella, Pasteurella, Pseudomonas and E. coli strains was exerted by the 3 potentiating compounds, trimetoprim being the most effective. Less effective was the combination of the potentiating compounds and sulfonamides, though their effect exceeded that of the sulfonamide alone. Table 1; references 3.

BULGARIA

MUTAGENIC EFFECT OF ALPHATOXIN B₁ ON E. COLI

Sofia DOKLADY BOLGARSKOY AKADEMII NAUK in English Vol 29 No 12, 1976 signed to press 21 Jul 76 pp 1839-1840

MARKOV, K., GRIGOROV, I., SHIVAROVA, N., and ANGELOV, T., Institute of Microbiology, Bulgarian Academy of Sciences, Sofia

[Text] Alphatoxins are the products of the vital activity of moulds of the genus of Aspergillus flavus. In addition to their high toxicity they possess hepatocarcinogenic action toward hamsters, mice and rats. Parallel with that, a certain mutagenic effect of the alphatoxins has been established after their transformation in the liver (Maling, Scaife, Garner). For the first time the idea of a mutagenic effect of the alphatoxins per se was suggested by Garner (1973) who established the existence of mutations in transforming DNA treated with alphatoxin.

There is no information in the literature about any direct mutagenic action of alphatoxin on certain bacteria. There are publications in this field reporting on the mutagenic effect of alphatoxin B₁ on strains of E. coli K₁₂ and Salmonella typhimurium following a certain transformation of the toxin in the liver (Ames (1971), Wragg (1967), Garner, Wright).

The principal task in the course of our present work was to test the possibility of direct effect by alphatoxin B₁ on E. coli without preliminary metabolic activation of the toxin.

MATERIAL AND METHOD. The experimental object used was the auxotrophic strain of E. coli 3462 509a with the following characteristic: his⁻; lac⁺;

rha⁺; str^S; fla⁺; w^F⁻. The strain was cultivated in nutrient medium M₉ with histidine added, while the reverted mutants were selected on a fasting nutrient medium M₉.

The alphatoxin used in the experiments was obtained by cultivation of a toxic strain of *Aspergillus parasiticus* on rice. Following extraction with chloroform, the toxins were separated by column chromatography on silicagel and were supplementarily purified by thin-layer chromatography on silicagel G. Finally, alphatoxin B₁ was dissolved in methanol and its concentration was determined spectrophotometrically.

The testing of the mutagenic effect of alphatoxin B₁ was carried out by treating a suspension of 10⁹ kl/ml of the experimental strain with 6 γ/ml alphatoxin in the course of 210 minutes. After that the cells are washed and inoculated on a minimal medium. The mutagenic effect was calculated in percentages according to the frequency of reverting which is expressed in the ratio of the reverted cells to the total number of initially inoculated cells.

An extinction curve of the experimental strain under the effect of the toxin was made for the purpose of determining the optimum conditions for the manifestation of the mutagenic effect of alphatoxin B₁.

In view of the fact that alphatoxin is soluble in methanol, control experiments were carried out in liquid and solid media to establish the extent of the inhibition effect of methanol on the experimental strain. It turned out that the methanol concentration used in dissolving the alphatoxin is not in a position to contain the development of *E. coli*.

Comparative experiments for evaluating the mutagenic effect of alphatoxin B₁ were carried out in relation to one of the classical mutagens such as N-methyl-N'-nitro-N-nitrosoguanidine and to L-cysteine-bis-(N,N-chloroethyl)-hydrazide.

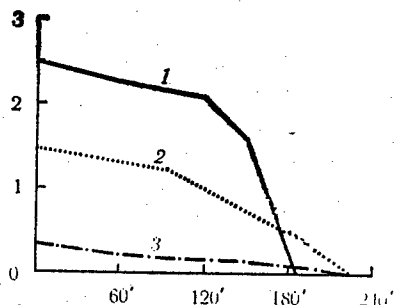


Fig. Extinction curve of *E. coli* after treatment with:

1. L-cysteine-bis-N,N-chloroethyl hydrazide at concentration 10 mol/ml; 2. N-methyl-N'-nitro-N-nitrosoguanidine at concentration 30 mg/ml; and 3. alphatoxin B₁ at concentration 6 γ/ml. Abscissa: time in minutes; ordinate: natural logarithm of the number of colonies

RESULTS AND DISCUSSION. The treatment of the experimental strain with alphatoxin in concentrations of 0.5 γ/ml, 1 γ/ml, 2 γ/ml, 4 γ/ml, 6 γ/ml, 10 γ/ml, 20 γ/ml, 50 γ/ml and 100 γ/ml showed that the retention effect of the experimental strain takes place at 10 γ/ml.

The extinction curve was made with a concentration of 6 γ/ml, with terminal time of effect of 270 minutes. The curve shows that after 210 minutes of treatment the survival rate of the culture is approximately 10⁻⁴, and on that account all experiments were carried out at that concentration of alphatoxin and with that period of effect. The Figure shows also the extinction curves of the experimental strain which were obtained by treating N-methyl-N'-nitro-N-nitrosoguanidine and L-cystein-bis-(N,N-chloroethyl)-hydrazide. The graph shows the relatively weak mutagenic effect of the alphatoxin, compared with the remaining 2 mutagens.

In the treatment of the experimental strain with alphatoxin B₁, we established a reversion in relation to prototrophicity with a frequency fluctuating between 1.1×10^{-6} and 5.2×10^{-6} . The corresponding value for nitrosoguanidine was 3.1×10^{-3} and 2.6×10^{-1} for L-cysteine.

The results obtained show that under these experimental conditions alphatoxin B₁ is manifested as a weak mutagen, while, on the other hand, this indicates that it may possess mutagenic effect per se. Similar experiments with alphatoxin treated with liver homogenate give considerably higher values of reversion, and also higher toxicity in relation to certain bacterial strains, such as *E. coli* K₁₂ and *Salmonella typhimurium* TA1530, 1531. Whereas the mutations taking place with transformed alphatoxin are of the "frameshift" or basepair substitution, the results obtained by direct action with alphatoxin B₁ on *E. coli* are indicative of the emergence of typical point mutations which have taken place as a result of the substitution of one base pair with another.

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PROPERTIES OF INTRACELLULAR A-PARTICLES AND THEIR ROLE IN THE REPRODUCTION OF CARCINOGENIC VIRUSES TYPE B AND C

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 83 No 1, Jan/Feb 77 pp 38-53

LEBEDEVA, YE. N., and BUKRINSKAYA, A. G., Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR

[Abstract] A survey of literature and material on the methods of extraction, biochemical and biophysical properties and functions of A-particles of carcinogenic viruses. These particles were discovered by Bernhard et al (1955). For a long time their study has been restricted to electron microscopic method observations, since there were no methods for obtaining them for direct research. Tanaka and Tsujimura (1969) first isolated the particle. Smith and Wivel extracted cytoplasmic A-particles from mitrochondrial fractions of tumor cells. There are now a number of methods for obtaining cytoplasmic A-particles. A. G. Bukrinskaya has developed a method different from the others. The instability of A-particles in human cells hinders the study of their biochemical properties. This can be avoided by treating them with RNAase. Present data on cytoplasmic A-particles does not give a definitive answer to the possible functions of A-particles, especially whether or not they are predecessors of viruses in mice. Bukrinskaya (1974) has shown that cytoplasmic A-particles from human cells are products of the functioning of a viral genome. The problem of the connection between A-particles from human cells and Mason-Fraiser type virions is still unclear. The second section is devoted to intracisternal A-particles, especially reports in the Western literature. Such particles are 80% protein, 14% phospholipids, and 4.6-6.8% RNA. Attempts to show the infectiousness of A-particles, using cells from mouse tumors, have not been successful. There is a widely held view that intracisternal A-particles are immature forms of extracellular type C particles (Watson, et al, 1970). This view is only based upon electron microscopic observations. Hall, et al, (1968) have disagreed with this. Thus, present data is contradictory and does not completely explain the nature of intracisternal A-particles and their link with type C particles. Various studies are compared in a table. Table 1; references 86: 9 Russian, 77 Western.

USSR

UDC 615.33.014.45.074:542.67

MEMBRANE FILTRATION METHOD FOR THE DETERMINATION OF STERILITY AND MICROBIAL DISSEMINATION OF ANTIBIOTICS

Moscow ANTIBIOTIKI in Russian Vol 22 No 2, Feb 77 signed to press 20 May 76 pp 113-117

KLIMOVA, N. YE., and GRIGOR'YEVA, V. M., Laboratory of Antibiotics, Scientific-Research Institute of Drug Standardization and Control, Ministry of Health USSR, Moscow

[Abstract] Antibiotics with different chemical structures are absorbed on membrane filters during the filtering process. The amount of the antibiotics being absorbed may be diminished by an increased volume of wash-liquid, but it is not possible to remove completely all antibiotic material from the filters. When the filters are immersed in liquid thioglycol medium, the antibiotics retained by the filters did not stop the growth of sensitive microorganisms. When the filters were placed on the surface of agar, only the forms resistant to a given antibiotic showed growth of about 26-43%. (The sensitive microbes exhibited only an 0.3-1.3% growth level). To improve the capability of determining microbial dissemination, it is necessary to select agents capable of inactivating residual antibiotics absorbed by the filters. Tables 2; references 9: 1 Russian, 8 Western.

USSR

UDC 576.8.093.3

STORAGE OF ACTINOMYCES CULTURES IN PHYSIOLOGICAL SOLUTION

Alma-Ata IZVESTIYA AN KAZAKHSKOY SSR in Russian No 1, Jan/Feb 77 pp 50-54

ORLOVA, R. S., and SARTBAYEVA, U. A.

[Abstract] There are various methods for the prolonged storage of actinomyces, as described in McGinis, et al, (1974), Chance (1963). A storage method is covered by US Patent 2187357, 1940 and USSR inventors certificate (avt. svid. 192141, 1967). In 1969 a large group of actinomyces (172 strains) were stored in a physiological culture using the Chayka method (Chayka, N. A., 1968). Of the 172 strains belonging to 41 species, 169 retained their vitality (98.2%) during a 24 month storage period. For a number of cultures vitality remained high after 72 months at room temperature. Up to 92% of the cultures retained their vitality during repeated research. Strain 1128 had a 59.1% survival rate after a three month storage period, strain 1321 had high vitality after 41 months of storage. Two tables give a detailed strain and species breakdown of vitality and survival rates. The method of storage in a physiological salt solution can be recommended for various groups of actinomyces. They can be stored for prolonged periods at room temperature and do not require special refrigeration equipment. Tables 2; references 4 (Russian).

SOME ASPECTS OF THE EFFECT OF FUNGI ON PLASTIC

Novosibirsk IZVESTIYA SIBIRSKOVO OTDELENIYA AKADEMII NAUK SSSR in Russian No 6, Dec 76 signed to press 3 Dec 75 pp 21-27

NAPLEKOVA, N. N., and ABRAMOVA, N. F., Novosibirsk Branch, ONPO "Plastpolimer"

[Abstract] Nine species of fungi were grown on plastics (Phenolplast, polystyrol and polyethylene). The formation of free amino acids on these substrates was quantitatively and qualitatively determined. Various vitamins of the B-complex were produced by each species on the several plastics and were semi-quantitated. Organic acids (citric acid, butyric acid, lactic acid, tartaric acid and malic acid) were also produced variously and semi-quantitated. The metabolites synthesized by these fungi on plastics could be used for developing quantitative methods for determining biostability of plastics and also for predicting the resistance of a given plastic to biodegradation. Figure 1; tables 3; references 4 (Russian).

USSR

UDC 576.315+577.214

CHANGES IN ELECTROKINETIC PROPERTIES OF CELL NUCLEI UNDER THE INFLUENCE OF REGULATORS OF BIOSYNTHESIS OF NUCLEIC ACIDS WITH RESPECT TO NUCLEAR STRUCTURE AND FUNCTIONAL GENE ACTIVITY

Kiev DOPOVIDI AKADEMII NAUK UKRAYNSKOY SSR.SERIYA B in Ukrainian No 1, Jan 77 signed to press 22 Sep 76 pp 86-88

CHESKHO, V. F., and SHAKHBAZOV, V. G., Kharkov State University

[Text-English language abstract supplied by authors] The influence of regulators of nucleic acid synthesis was studied as applied to the electrokinetic properties of plant cell nuclei. All inhibitors of RNA biosynthesis lead to an increase in the number of positively charged nuclei. The growth stimulator leads to an opposite effect. These changes cannot be explained only by ionic adsorption by the nuclear surface. The value of the electrokinetic potential of the cell nucleus is assumed to depend on the level of gene activity. Table 1; references 13: 10 Russian, 3 Western.

USSR

UDC 547.95

CHANGES IN CONTENT OF TOTAL LIPIDS, PHOSPHOLIPIDS, AND NEUTRAL LIPIDS IN MICROSOMES AND MITOCHONDRIA OF RAT LIVER IN CHEMICAL CARCINOGENESIS

Moscow BIOKHIMIYA in Russian Vol 42 No 3, Mar 77 signed to press 2 Aug 76 pp 499-504

POLYAKOV, V. M., LANKIN, V. Z., ARKHANGEL'SKAYA, A. V., and VLAGORODOV, S. G., Rostov Scientific Research Oncology Institute, Ministry of Health RSFSR; Institute of Chemical Physics, Academy of Sciences USSR, Moscow

[Text-English language abstract supplied by authors] Sharp increase in the content of total lipids and, especially, neutral lipids, and considerable decrease in the content of phospholipids were observed in liver microsomes and mitochondrias from liver of tumorbearing rats in the process of the growth of sarcoma, induced by a single injection of 3,4-benzpyrene. The injection of anthracene, a non-carcinogenic hydrocarbon, practically did not affect the lipid composition of rat liver subcellular particles. Thus, the disturbances in normal functioning of subcellular particles in carcinogenesis, are due to considerable change in the chemical composition of biomembranes. The data obtained confirm our hypothesis on lipid mobilization in tumor growth. Figures 4; references 15: 8 Russian, 7 Western.

USSR

UDC 576.8

MACROMOLECULAR ORGANIZATION AND BIOCHEMICAL CHARACTERISTICS OF THE GENOME OF PHAGE FI-1

Moscow BIOKHIMIYA in Russian Vol 42 No 3, Mar 77 signed to press 26 Jul 76
pp 470-475

ANDRIASHVILI, I. A., ADAMIYA, R. SH., PATARIDZE, T. K., and TUSHISHVILI, D. G., Laboratory of Molecular Biology of the Tbilisi, Scientific Research Institute of Vaccines and Sera, Ministry of Health USSR

[Text-English language abstract supplied by authors] The molecular weight of phage FI-1 DNA is determined by the methods of sedimentation and kinetics of reassociation, as well as from buoyant density values of virion components and specific partial volume of DNA (85×10^6 daltons). The spectral analyses showed that the distribution of guanine-cytosine pairs along the whole length of the molecule is Gaussian. The DNA content in the particle of FI-1 makes up to 41%, which is 7% less as compared to the morphologically related phage T4. The protein component analysis of phage FI-1 demonstrated that the genome of this virus is capable of encoding at least 20 different proteins. Possible reasons for differences in the molecular weights of the genomes of T4 and FI-1 phages are discussed. Figures 4; table 1; references 18: 6 Russian, 12 Western.

USSR

UDC 576.853.23;547.963.3

FEATURES OF MELTING OF DOUBLESTRAND RNA OF ENCEPHALOMYOCARDITIS VIRUS

Moscow BIOKHIMIYA in Russian Vol 42 No 3, Mar 77 signed to press 13 Sep 76
pp 544-548

CHUMAKOV, K. M., Department of Virology and Laboratory of Molecular Biology and Bioorganic Chemistry imeni A. N. Belozerskiy, Moscow State University, Moscow

[Abstract] The author's laboratory has demonstrated earlier that with the removal of denaturing action, complementary chains of doublestrand replicative forms of the RNA of encephalomyocarditis (EMC) virus are capable of rapid re-naturation; this involved a certain cross linking which inhibits their cleavage. The author has studied melting of the replicative form of the virus RNA to determine whether the cross linking involved a segment of poly-guanylic acid-polycytidylic acid (whose presence is known to lend high temperature stability to the doublestrand molecule). The EMC virus used was isolated from Krebs II ascites carcinoma, the poly G- Poly C from the corresponding Calbiochem polynucleotides. Melting temperatures of these samples were measured optically with the Beckman ASTA S III spectrophotometer at 260 nm, the poly G- poly C at 280 nm. Results illustrated by melting curves

clearly indicated that the cross linking can be explained by the presence of the heat stable poly G- poly C segment. The biological role of the segment enriched with CG pairs is discussed, and the author's present research is devoted to its clarification. Figures 4; references 16: 4 Russian, 12 Western (two of the latter are from Chumakov's laboratory).

USSR

NEW HYBRID OF PHAGES λ AND $\phi 80$

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 233 No 4, Apr 76 signed to press 3 Jan 76 pp 702-703

RYBCHIN, V. N., and KIRPICHNIKOVA, T. P., Leningrad Polytechnical Institute imeni M. I. Kalinin

[Abstract] Phages λ and $\phi 80$ are the most studied of lambdoid phages. The authors have isolated a new hybrid of them which they have called $\phi 80$ hy 43. It is produced as the result of joining, to phage $\phi 80$ cl25h λ , of mutation λ c17, and not by appearance in this phage of additional mutation. The exact genetic structure of hybrid $\phi 80$ hy 43 is as yet unknown. According to complementation analysis, gene N in this hybrid is derived from phage $\phi 80$. Phages $\phi 80$, $\phi 80$ hy43, and $\phi 80$ cl25h λ will grow on those cells which do not inhibit development of phages that have gene P from phage λ . Thus, hybrid $\phi 80$ hy43 is formed as the result of two acts of recombination: non-homologous recombination in the area of cI-y and recombination in the area of homologs c. The second act of recombination is caused, evidently, by the necessity of including into the genome of hybrid $\phi 80$ hy 43 site t_{R_2} from DNA of phage $\phi 80$. Study of the genetic properties of the hybrid support the existence of site t_{R_2} in phage $\phi 80$. Figure 1; references 12: 2 Russian, 10 Western.

USSR

UDC 576.858.63:577.21

PROVIRUS GENETIC MATERIAL OF THE RAUS SARCOMA VIRUS IN MAMMAL TUMOR CELLS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 234 No 1, May/Jun 77 signed to press 21 Jan 77 pp 203-206

FARASHYAN, V. R., OBUKH, I. B., SEROV, S. M., and ZHDANOV, V. M., Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR; Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, Academy of Medical Sciences USSR

[Abstract] An attempt was made to study the peculiarities of the provirus genetic material in nonvirogenic tumor cells. This was done by setting up the following tasks: determination of the quantity of RSV-specific sequences in the nonvirogenic and virogenic cells, determination of the level of expression of RSV provirus in these cell systems and the physical condition of RSV-specific DNA in these cells. The data produced on the characteristics of RSV provirus in two nonvirogenic cell lines RVP₃ and TWERC showed that they contain a smaller number of genomes per cell than the virogenic cells XS, and that the provirus is defective. Study of the peculiarities of the defect of the RSV genome in these cells will be a subject of further study. Hybridization of the ³H-DNA transcript of RSV with the supernatant and "reticular" fractions of DNA from the XC, RVP₃ and TWERC cells showed that the genetic material of RSV is contained in these cells primarily in integrated form. The small quantity of virus-specific sequences in the supernatant DNA fractions may be related to breaking of the sequences of DNA threads forming the "reticulum." It is also possible that RSV-specific sequences are found in the supernatant fraction, integrated in molecules incapable of forming the "reticulum." It is also possible that the tumor cells contain provirus genetic material in the form of episomes. This question requires further study. Figure 1; tables 2; references 10: 1 Czech, 9 Western.

USSR

UDC 576.3:615.849

CYTOGENETIC EFFECT OF UV-IRRADIATION OF MAMMALIAN CELLS AT THE G₂-PERIOD

Novosibirsk IZVESTIYA SIBIRSKOVO OTDELENIYA AKADEMII NAUK SSSR in Russian No 6, Dec 76 signed to press 30 Dec 75 pp 108-111

OSTROVSKAYA, R. M., STOLBOVA, N. G., LEBEDEVA, L. I., GRUZDEV, A. D., and TSIMMERMAN, V. G., Institute of Cytology and Genetics, Siberian Department, Academy of Sciences USSR, Novosibirsk

[English abstract supplied by the source]

[Text] Chromosome rearrangements were induced by UV-rays at 254, 265 and 280 nm at the G₂ period in the primary culture of mouse embryonic fibroblasts.

The chromosome rearrangements were studied at the first mitosis after irradiation. Approximately 6% aberrant cells were observed in the irradiated cultures. The effect of UV-rays does not depend on the wavelength nor irradiation dose in the range of 40-120 erg/nm²; it was also not modified by caffeine. The chromosome rearrangements consisted only of breaks of chromatid and isochromatid types; there were no exchanges. It is suggested that the chromosome aberrations, which are observed after UV-irradiation in cells at G₂, arise as the result of the indirect action of irradiation on chromosomes. Figure 1; table 1; references 8: 4 Russian, 4 Western.

USSR

UDC 577.15.024

SECRETORY AND METABOLIC PROCESSES IN ISOLATED NERVE ENDINGS (SYNAPTOSOMES)
SEPARATED FROM THE RAT BRAIN WHEN DEPOLARIZED IN VITRO

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 234 No 1, May/Jun 77 signed
to press 21 Jan 77 pp 235-238

RODINA, V. I., ROZHANETS, V. V., KRYZHANOVSKIY, G. N., VOLOVINSKAYA, O. I.,
SAMSONOVA, N. A., and GLEBOV, R. N., Institute of General Pathology and Patho-
logic Physiology, Academy of Medical Sciences USSR, Moscow

[Abstract] A study is made of the secretory and metabolic processes in the synaptosomes of the rat brain using various depolarizing effects (electric stimulation, KCl and ouabain). The results show that electric stimulation of synaptosomes is accompanied not only by Ca-dependent expulsion of the mediator, but also Ca-dependent liberation of ATP. Depolarization of the synaptosomes together with secretion of the mediator may be accompanied by an increase in resynthesis of this mediator and renewal of the proteins of the synaptic structures. Figure 1; table 1; references 15: 5 Russian, 10 Western.

USSR

UDC 616.127-005.8-092.9-07:616.127-091.8-07

MORPHOLOGICAL CHANGES IN THE MYOCARDIUM OUTSIDE THE ZONE OF AN EXPERIMENTAL INFARCTION

Moscow ARKHIV PATOLOGII in Russian Vol 39 No 2. signed to press 26 Mar 76 pp 45-51

CHERPACHENKO, N. M., ZHDANOV, V. S., SHAROV, V. G., Laboratory of Pathological Anatomy, Institute of Cardiology imeni A. L. Myasnikov, Academy of Medical Sciences USSR, Moscow

[Abstract] A detailed morphological study has been made to determine whether the sectors of the myocardium beyond the zone of a disrupted coronary circulation do in fact remain intact during the course and development of an infarction. The point was important since those sectors remote from the affected zone must provide the contractive function of the heart as a whole, and support bodily hemodynamics at the necessary level. Chinchilla rabbits, 2.5-3 kg, were used as the test animals; the infarction was induced by tying off the descending branch of the left coronary artery. The authors found spatial and focal vascular destruction in the areas outside the infarct zone, which were especially pronounced in the early stages of the experiment, appearing primarily as disruption of the venous circulation. The extra-infarct segments of the myocardium constantly exhibited dystrophic changes of the muscular fibers, culminating at times in necrosis of individual myofibrils with subsequent change in their connective tissue and formation of foci of cardiosclerosis. Presence of disturbance of blood circulation, histological and ultrastructural changes in the myofibrils in portions of the myocardium outside the infarction indicate that those sectors do not remain intact. Disruptions of circulation, appearance of acute overload of the extra-infarction sectors, and, also, the activation of the sympatho-adrenal system play a substantial role in the development of the dystrophic and necrobiotic changes in myocytes. Figures 3; references 23: 17 Russian, 6 Western.

USSR

UDC 616-001.34-07:616.13/.14-073.731

RHEOGRAPHIC STUDY OF THE STATE OF PERIPHERAL VESSELS IN VIBRATION PATHOLOGY

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 3, Mar 77 signed to press 4 Oct 76 pp 26-30

VASKEVICH, N. N., and YELETSKOVA, A. S., Chelyabinsk, Medical Sanitation Station of the Chelyabinsk Tractor Plant

[Abstract] The condition of peripheral vessels in metal chippers and in workers suffering from vibration disease was studied by means of rheovasography. The most important indices in vibration pathology were: the height of the amplitude (10 m), the rate of blood flowing in, and the rate flowing out. The

data collected showed that after about a 10 year work span, the blood supply in patients with all stages of vibration disease was significantly deteriorated, accompanied by elevated arterial tonicity and venostasis in fingers. Results of nitroglycerine tests led to conclusion that there was a significant fall of compensatory capabilities of the vascular system in I-II and II stages of vibration disease. Table 1; references 27: 23 Russian, 4 Western.

USSR

UDC 615.015.74

TACHYPHYLAXIS

Moscow USPEKHI SOVREMENNOY BIOLOGI in Russian Vol 83 No 1, Jan/Feb 77 pp 126-138

ZEMSKOV, M. V., ZHURAVLEVA, N. V., ZEMSKOV, A. M., Voronezh Medical Institute

[Abstract] An examination of the problems of tachyphylaxis, substances inducing it, forms of its manifestation, mechanisms of its operation, and its significance. The sections are: the phenomenon of tachyphylaxis (3 pages), mechanisms of tachyphylaxis (6 pages), conclusions (1). Special attention is given to the works of Arkad'yeva, Braude, Yermoleva, Zemskov, as well as Braun and numerous Western specialists. The works surveyed cover endotoxins, endoxins, and infections of animals by polysaccharides of various microorganisms as well as the tachyphylactic properties of nucleic acids. Data on the mechanisms of tachyphylaxis are very contradictory. Microbe polysaccharides have been studied the most. The significance of humoral factors has still not been conclusively explained. It is suggested that research on using microdoses of vaccine in combination with nucleic acid might prove promising. It is recommended to divide the field into infectious and noninfectious tachyphylaxis and divide the stress reaction of the body into two stages. Table 1; references 138: 49 Russian, 89 Western.

USSR

UDC 591.513.4:592

HABIT AND ITS MECHANISMS IN INVERTEBRATES

Moscow USPEKHI SOVREMENNOY BIOLOGI in Russian Vol 83 No 1, Jan/Feb 77 pp 112-125

VORONIN, L. G., KAPLAN, V. I., Biology Faculty of Moscow State University

[Abstract] A survey of Soviet and foreign literature on contemporary research in the physiological mechanisms of habit formation as the simplest form of the adaptation of bodily activity. It is shown that the use of invertebrates as physiological models is very productive in revealing mechanisms of learning and memory at all levels, including human. The results of this research are systematized, starting with the simplest, and include the responses to mechanical or electrical stimuli. The works of Voronin, Doronin, Karas', Sokolov, Tushmalova, Applewhite, Gardner, Patterson, Krasne, Kupfermann, Perets, and others are covered. Sections cover: worms (2 pages), molluscs (3.5 pages) arthropods (2 pages). References 106: 19 Russian, 87 Western.

USSR

UDC 617-001.34-07:616.8-009.63-072.7

HEAT AND THERMAL PAIN SENSITIVITY IN VIBRATION DISEASE

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYE ZABOLEVANIYA in Russian No 3, Mar 77 signed to press 12 Jul 76 pp 31-36

ABRAMOVICH-POLYAKOV, D. K., Khar'kov, Institute of Labor Hygiene and Occupational Diseases

[Abstract] Patients suffering from vibration disease showed a lowering of heat and thermal pain sensitivity not only at the sites of direct contact with vibration but also on other parts of the body. The heat sensitivity is affected more often than the sensitivity to pain emanating from heat. The heat sensitivity indices are more asymmetric than thermal pain indices. This study elucidated some aspects in the pathogenesis of vibration disease and it could possibly be useful in diagnosis as well as in prognosis of therapeutic interventions. Tables 2; references 2 (Russian).

USSR

UDC 581.167:633.11

EXPERIMENTAL PRODUCTION OF NEW ROUNDGRAIN FORMS OF SOFT WHEAT

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 2, Mar/Apr 77 signed to press 12 Jul 74 pp 308-311

ZOZ, N. N., YAKUBTSINER, M. M., and MOROZOVA, I. S., Institute of Chemical Physics, Academy of Sciences USSR, Moscow; All-Union Scientific Research Institute of Plant Breeding imeni N. I. Vavilov

[Abstract] In *Triticum* L., only the soft wheat *T. sphaerococcum* Perc. has a spherical grain form. Locus S, which determines the phenotype of natural roundgrain wheat, controls a complex of consistently-inherited traits: the spherical form of the grain, broad hard leaf, short sturdy stalk, swollen (inflated) ear scales, short non-wilting, thickened spike. The spherical form is known to increase yield of flour. High protein content of the grain, which many spherical forms possess, is a positive feature for their production and selection. There are some negative features--low productivity, small grain, and susceptibility to yellow rust. The authors have investigated potential for production of spherical forms. A number of mutants of roundgrain lines are described which are original as compared to the starting sort. These lines were obtained as the result of many years work collecting spherococcoid mutants, separated in M_1 , in the soft winter wheat sort Belotserkovskaya 198 under the action of N-nitroso-N-ethylurea. An experimentally-produced variety of spherical forms of polymorphism of *T. sphaerococcum* Perc. is of considerable selection interest, especially the constant form *Varietas quasilutescens* Jakubz. et Zoz (line No 40). This line can serve as a donor of the trait of roundgrain shape in hybridization. Additional data was obtained on decoding the genetic nature of Locus S, and broad possibilities were indicated for experimental mutagenesis in production of new botanical plant forms. Figures 2; references 17: 5 Russian, 12 Western.

USSR

UDC 633.511:665.335.9

CHANGES IN FATTY ACID COMPOSITION OF COTTON SEED OIL UNDER THE EFFECT OF
ULTRASOUND

Moscow DOKLADY VASKHNIL No 2, Feb 77 pp 16-17

KHABIBULLAYEV, P.K., doctor of physical-mathematical sciences, and MAMADALIYEV, A. KH., and TOPVOLDIYEV, T. U., candidates of biological sciences, Andizhan Institute of Cotton Growing

[Abstract] In recent years the oil content of cotton seeds has declined sharply for reasons which have not been completely explained. There has so far been no study of the effect of ultrasound on improving the quality of oil seeds. Such a study was made on the fatty acid composition of the Tashkent-1, Andizhan-1, and S-6030 varieties of cotton. Seeds were soaked in tap water for 24 hours and subjected to ultrasound in the 23 kilohertz frequency for 13 minutes. The controls were only soaked in water. The seeds were then planted at the test farm of the Andizhan Institute of Cotton Raising. Ultrasound has a definite influence on the chemical composition of seeds. The quantity of myristic, palmitic, and stearic acids was almost the same, while the content of linoleic acid in the controls was 1-3% lower than in the experimental variant. This is probably a result of ultrasound's effect on biosynthesis of these acids. Ultrasound had a stimulating influence on plant development. The experiment variants were 2-3 days ahead of the controls. Preplanting processing of cotton seeds with ultrasound will increase the content of some fatty acids (linoleic) and produce better plants. Table 1; references 9 (Russian).

USSR

UDC 633.18:581.13

PHOTOSYNTHETIC ACTIVITY OF RICE VARIETIES AS A PHYSIOLOGICAL CHARACTERISTIC
FOR THEIR EVALUATION IN CONDITIONS OF LOWER REACHES OF THE SYRDAR'YA RIVER

Alma-Ata IZVESTIYA AN KAZAKHSKOY SSR in Russian No 1, Jan/Feb 77 pp 10-18

ZHAYLYBAYEV, K. N.

[Abstract] The photosynthetic activity of various varieties of rice has not yet been studied for this region. The selection department of the Kazakh Scientific Research Institute for Rice conducted the experiment using the following regionalized varieties (for Kyzyl-Orda Oblast'): Kuban'3 (standard), Dubovskaya 129, and selection samples KzROS 358, 168-3, KzROS 043, KazNIIR 9, 127-10, KzROS 356. Photosynthetic potential should distinguish "photosynthetic potential of vegetative growth" and "photosynthetic potential of grain forming." The dynamics of leaf surface formation, leaf water content, and accumulation of dry biomass (presented in three graphs) differ somewhat for the various varieties and have an effect upon their yield and other characteristics. Some characteristics of the types of rice tested:

	Kuban'3	KzROS 168-3 358	Dubovskiy 129	KazNIIR 9	KzROS 043
Coefficient of economic efficiency of photo- synthesis (%)	31.6	33.0 34.3	38.9	34.0	26.8
Number of grains on main tassle (whole)	83.4	76.4 65.0	71.1	76.8	84.3
Output of full valued grain (grams)	3.63	3.54 3.60	3.75	3.94	4.39

Plants selected simply for a highly active photosynthetic apparatus will be efficient if they do not have sufficiently large tassels. However, the KzROS has large tassels but also has a large percentage of broken grain. Figures 3; tables 3; references 15 (Russian).

USSR

UDC 635.21:632.4

ROLE OF PHYTOALEXINS IN POTATO IMMUNITY TO EARLY DRY BLIGHT

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 2, 1977 pp 33-38

DOROZHKIN, N. A., academician of Academy of Sciences, Belorussian SSR, REMNEVA, Z. I., (deceased), candidate of agricultural sciences, and IVANYUK, V. G., candidate of biological sciences, Belorussian Order of the Red Banner of Labor Scientific Research Institute of Potato Breeding and Fruit and Vegetable Breeding

[Abstract] Seeking the source of resistance to early dry blight in potatoes is very important in developing resistant varieties. Phytoalexins have been proven effective agents against this disease. The greater the amount of rishitin and lubimin formed during infection, the greater the resistance. The phytoalexin formative activity is especially high at the early growing stages. The greatest resistance is formed in varieties able to form phytoalexins upon contact with the causative agents of the diseases. Tables 2; references 11: 7 Russian, 4 Western.

BULGARIA

ISCHEMIC HEART DISEASE AS CAUSE OF DEATH IN CERTAIN OCCUPATIONAL GROUPS

Sofia VATRESHNI BOLESTI in Bulgarian Vol 15 No 1, 1977 signed to press May 76 pp 58-63

TSOLOV, Khr., MILADINOVA, ST., and DIMITROVA, G., Medical Academy, Sofia

[Text-English language abstract supplied by authors] The authors studied the ischemic heart disease incidence as cause of death in 5673 workers, retired due to a disease (general, occupational disease and accident). The workers in 2.9 per cent were found to die of ischemic heart disease with a 15 years length of service and at the age of 60. Miners die in 0.2 percent of ischemic heart disease, teachers--in 5.1 percent, drivers--8.9 percent, engineers (management personnel)--in 13.5 percent, etc. The deceased of ischemic heart disease in 2 percent have worked in favorable working conditions, in 13 percent--in contact with poisons, in 20 percent--with unfavorable microclimate, in 41 percent with mental work, etc. The work in unfavorable working conditions and nervous-psychic strain was proved to appear as a risk factor for the origination of ischemic heart disease. Figures 2; tables 2; references 10: 2 Bulgarian, 6 Russian, 2 Western.

CZECHOSLOVAKIA

UDC 616-084:613.2

QUALITATIVE CHANGES IN THE NUTRITION OF THE POPULATION AND DISEASE PREVENTION THROUGH NUTRITION

Prague CASOPIS LEKARU CESKYCH in Czech Vol 116 No 4, 28 Jan 77 pp 97-100

HEJDA, S., Center for Hygiene of Nutrition, Institute of Hygiene and Epidemiology, Prague

[Abstract] Consumption of various foods in Czechoslovakia during the last 20 years, and changes in the usage of individual foods during that period, are discussed. Generally, consumption of proteins, mainly of animal origin, increased during this period. This is a healthy sign. The overall increase in consumption of proteins was 20 to 60 percent, according to various age groups. General increase in the overall intake of calories was 20 to 25 percent. There was also a healthy increase in the consumption of minerals and of some vitamins. A bad sign was a 60 percent increase in the consumption of fats. Consumption of sugar also increased, while the use of fibre-containing foods was reduced. The increase in the consumption of vitamin C was insufficient. Alcohol consumption has increased to 140 liters of beer and eight liters of spirits yearly per inhabitant. This corresponds to a yearly intake of nine liters of pure alcohol per inhabitant; this compares to a consumption of 17 liters in France and 13 1/2 in Italy. Moderate amounts of alcohol represent an important source of food. Excess is dangerous, but is counteracted to a very

considerable extent as help can be given by massive doses of vitamins B. An important factor is an increasing usage of processed foods. This may be dangerous. For instance, when potatoes are processed their content of vitamin C is drastically reduced. For poor old people, potatoes in Czechoslovakia provided over 50 percent of the needed vitamin C intake. It is important to develop the science of prevention of certain diseases by proper food administration. References 20: 13 Czech, 7 Western.

CZECHOSLOVAKIA

SOME PROBLEMS OF POST-GRADUATE TRAINING OF GENERAL PRACTITIONERS

Prague CESKOSLOVENSKE ZDRAVOTNICTVI in Czech Vol 25 No 3, Mar 77 signed to press 17 Sep 76 pp 139-141

DLOUHY, V., MU Dr., Department of Organizational Methodology, Kraj Institute of Public Health, Usti n.L.

[Abstract] The authors investigated post-graduate training of 101 recently graduated general practitioners in the area of Northern Bohemia. This number represents 32.3 percent of the total number of GP's. 16.8 of the total are over the age of 60, and 40.9 percent graduated more than 20 years ago. Among the recent graduates 45.5 percent had no post-graduate training at all. Only 18.8 percent of the recent graduates attended specialized courses for GP's. The rest attended some medical post-graduate courses not connected with their future career. Most physicians who specialize in a branch of medicine take post-graduate courses. This is not so with GP's. It is recommended that specialized training in this medical practice be instituted. The urgency to start such formal training is even greater because the 15th Congress of the Czechoslovak Communist Party decreed that GP's were to have definite professional and political duties.

USSR

UDC 616.12-005.4+616.12-005.8]-055.1-036.21(574.31-22)

THE EPIDEMIOLOGY OF ISCHEMIC HEART DISEASE AMONG THE MALE RURAL POPULATION OF
KARAGANDA OBLAST

Moscow KARDIOLOGIYA in Russian No 2, Feb 77 signed to press 4 Aug 76 pp 96-100

ABZHANOV, YE. A., Department of Faculty Therapy, Karaganda Medical Institute,
and the Ul'yanov Rayon Hospital

[Abstract] The epidemiology of ischemic heart disease in the rural region of Central Kazakhstan has, up to now, not been investigated. With the fulfillment of all WHO requirements and recommendations, a one-stage epidemiological study of this disease was conducted in a non-organized population of rural males, 30 to 59 years of age. A total of 1450 persons was selected by means of random-numbers tables; 92.4% (1340) of them were examined. The majority of those examined (82.3%) were engaged in physical labor in various branches of agriculture, and 14.4% of them were engaged in clerical work. Ischemic heart disease was found in 55 persons (4.1%), among them 26 (47.2%) were newly diagnosed cases. Ischemic heart disease was found to be more than twice as frequent among clerical workers as among those engaged in heavy (3.3%) and moderately heavy (3.7%) physical labor. A correlation was established between the incidence of the disease and such leading risk factors as arterial hypertension, smoking, excessive body weight, limited exercise, and hypercholesterolemia. The conducted epidemiological study proves the necessity of the development and realization of preventive measures against ischemic heart disease among the rural population. Figures 4; tables 2; references 23: 17 Russian, 6 Western.

CZECHOSLOVAKIA

UDC 616.314:546.42:614.1/437.6/:616-001.28:612.014.4

Sr^{90} LEVELS IN THE TEETH OF THE SLOVAK POPULATION AND THEIR RELATIONSHIP TO THE RADIOACTIVE CONTAMINATION OF THE ENVIRONMENT

Bratislava BRATISLAVSKE LEKARSKE LISTY in Slovak Vol 67 No 1, Jan 77 signed to press 21 Jul 75 pp 24-32

CECHVALA, LUBOMIR; CARACH, J., and VIKTORY, D., Kraj Station of Hygiene, Bratislava

[Abstract] The authors studied the content of Sr^{90} in 7523 teeth extracted from Slovak population during the period 1967-1972. Sr^{90} was deposited from the global fall-out of radioactive materials, was retained in various foods, and ultimately accumulated in mineralized tissues of the human body. The highest content of Sr^{90} was found in first teeth of children born in 1967 when the radioactive deposition from the atmosphere was highest in the Slovak region. The average level was $0.197 \text{ s}^{-1} \text{ g}^{-1} \text{ Ca}$ (5.33 pCi/gCa). In the southern region of Slovakia the content of Sr^{90} was twice that of the findings in Northern Slovakia. Statistical evaluation of the results showed an interconnection in the individual steps of the Sr^{90} path. Figure 1; tables 4; references 15: 4 Czech, 2 Russian, 9 Western.

MUTANTS OF DROSOPHILA, SUPERSENSITIVE TO IONIZING RADIATION

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 234 No 1, May/Jun 77 signed to press 10 Jan 77 pp 199-202

KHROMYKH, YU. M., VARENTSOVA, YE. R., and ZAKHAROV, I. A., Leningrad Institute for Nuclear Physics imeni B. P. Konstantinov, Academy of Sciences USSR

[Abstract] Results are presented from evaluation of three sensitive lines: 4-2, 80-1 and 153-1 (line numbers in accordance with an earlier publication of the author). Line 80-1 has high somatic sensitivity to the lethal effect of the radiomimetic methylmethane sulfonate, line 153-1 manifests a sharp reduction in the frequency of spontaneous meiotic crossing over of chromosomes I and III, while line 4-2 is intermediate between the other two as to these criteria. The dose dependence of radiosensitivity of these three lines plus control line 3-4 was determined for various ages. Dose-effect curves were constructed from the survival rates and LD₅₀ were calculated. The experimental data produced were statistically processed by dispersion analysis of survival rates of flies and regression analysis of pupal survival rates as functions of dose. The results indicate that the realization of mutation is related not with the morphogenetic processes in the imaginal discs, but rather with more general processes, probably occurring at the cellular level. If it can be shown that the *Drosophila* mutants described in this article have elevated sensitivity not only to lethal, but also to genetically effective action of radiation and chemical mutagens, these mutants will be valuable for the development of sensitive methods of determination of mutagenic factors in the environment. Figure 1; references 10: 5 Russian, 5 Western.

HUNGARY

A NEW CARBAMIDE CONTAINING CONCENTRATE "LAKTOBETIN" PRODUCED FROM THE BY-PRODUCTS OF THE SUGAR INDUSTRY TO FEED DAIRY COWS

Budapest MAGYAR ALLATORVOSOK LAPJA No 2. signed to press 26 Feb 76 pp 71-77

TAMAS, JOZSEF

[Text-English language abstract supplied by author] A new concentrate (Laktobetin) basically produced from the byproducts of the sugar industry supplemented with carbamide among others can be fed mixed with mass feed-stuffs and ground corn. The basic ration of Laktobetin covers the daily maintenance requirement of the dairy cows, and meets the nutrient-, vitamin- and mineral requirements enough to produce 8-12 liters milk a day. By using a new feeding technology 3 trials were made: a) on groups of 47 cows under winter feeding conditions (I. trial), b) on groups of 15 cows in green roughage feeding period (II. trial), c) on groups of 20 cows to solve a problem arising from the lack of green roughages (III. trial). On these trials the effect of the basic ration made of the concentrate was studied on the following:

a) Milk production. The milk production was 12.8, 2.4 and 14.7% higher in the I., II. and III. trials, respectively, than in the controls.

b) Conversion of the specific starch equivalent and of crude protein. The experimental groups converted 9.5, 17.9 and 36.0% less starch equivalent and 24.7, 29.8 and 52.1% less crude protein in the I., II. and III. trials, respectively, than the controls to produce 1 liter milk (maintenance requirement included).

c) Conversion of specific net starch equivalent (maintenance requirement excluded) and of crude protein. The values obtained were related to the standard ones in Hungary of starch equivalent of 280 g and of crude protein of 60 g. The values obtained in the experimental groups were less than the standard values, whereas in the control groups these exceeded the standard starch equivalent value by 12.9, 29.3 and 95.7%, and that of the crude protein by 53.3, 61.8 and 126.7%, respectively.

d) Specific feed expenses. These were 8.4 and 35.3% less in the I and III trial, and--as was expected--2.5% higher in the II trial, respectively, than in the corresponding control groups.

e) Fat content of the milk. There was no difference whatever in this respect. It is the author's opinion that the concentrate can be used a) in the feeding technology based on identical, preserved feedstuffs round the year, for individual or group feeding, b) in the winter, when the traditional mass feedstuffs are fed, for individual and group feeding, and c) in the summer, when the traditional green roughage is fed, when unexpected difficulties in the green roughage supply arise.

Tables 7; no references.

HUNGARY

A NEW CARBAMIDE CONTAINING CONCENTRATE "NEOBETIN" PRODUCED FROM THE BY-PRODUCTS OF THE SUGAR INDUSTRY TO FEED FATTENING CALVES

Budapest MAGYAR ALLATORVOSOK LAPJA No 2 signed to press 16 Feb 76 pp 78-80

TAMAS, JOZSEF

[Text-English language abstract supplied by author] A new concentrate (Neobetin) based on the byproducts (dried beet pulp, molasses) produced by the sugar industry and supplemented with AP-18, ammonium sulfate, salt, mineral- and vitamin premix was fortified with 10% carbamide and mixed with ground corn and 1-2 kg hay. The feed was given ad libitum to fattening calves. The ration composed this way covers the daily maintenance-, and production requirement and all the vitamins and minerals needed. The essential indices of the fattening were checked in feeding experiments. It was found that the conversion of the specific starch equivalent, that of the crude protein and the specific feed expenses were 14.4, 18.7 and 12.5% less, respectively, and the daily weight gain was 8.8% higher than in the control groups ($P < 0.001$). As to the fattening indices, the less the weight of the calves at the beginning of fattening the higher were the conversion rates. Notably, the calves of around or less than 160 kg each used 13.5% less specific starch equivalent and 26.9% less crude protein to produce 1 kg weight than those with 180-200 kg each. Concurrently, the specific feed expenses were 14.9% less, and the weight gain 11.4% higher in the former groups ($P < 0.001$). Tables 2; references 5.

HUNGARY

DETECTION OF PREGNANCY AND SOME FETAL FUNCTIONS IN SWINE BY THE ULTRASONIC DOPPLER'S METHOD

Budapest MAGYAR ALLATORVOSOK LAPJA No 2 signed to press 10 Feb 76 pp 109-112

SZILVASSY, B., WEKERLE, L., and PASCHKE, H.

[Text-English language abstract supplied by authors] The ultrasonic Doppler's echography was tested. The studies were made on 45 sows and gilts with the Hungarian made "Babydop" (EMG). The Doppler's signals and their changes were detected during the process of pregnancy. It was found that the first indirect sign of pregnancy, the Doppler's signal of the dilated a. uterina media appeared around the 24th-28th day of pregnancy. From the 43rd day onward the Doppler's signals generated by the vital functions of the fetus (the heart beats, and the pulsation of the a. umbilicalis) can be demonstrated. The range of error on a single investigation base was determined by investigating 480 swine of different terms of pregnancy. This value was proved 5-8% until the 40th day of pregnancy. In a large scale trial 1400 investigations were

made, in which an additional test after an interval of one week completely cleared all previous "negative" results. The diagnosis was checked by the deliveries or post mortem examinations. Figure 1; table 1; references 9.

HUNGARY

REMARKS ON THE MILK YIELD OF 3349 LITERS/YEAR, ACHIEVED IN 1975 BY THE "DOZSA" COOPERATIVE FARM ON AN ALKALINE SOIL

Budapest MAGYAR ALLATORVOSOK LAPJA in Hungarian No 2, 1977 pp 129-130

DOMAN, I.

[Abstract] Observations carried out during more than two and a half decades indicate that cattle fed on fodder from alkaline soil has a better bone structure, higher fertility and a superior milk and meat yield in comparison with animals from farms with rich, humic soil. The fodder from alkaline soil favorably affects the rate of reproduction and the general health of the animals. However, the achieved milk production of 3349 liters/year is considered only an average achievement. Production of fodder for ruminants on alkaline soils should be widely supported.

HUNGARY

OCCURRENCE OF TGE-LIKE DISEASE IN INDIGENOUS SWINE STOCKS

Budapest MAGYAR ALLATORVOSOK LAPJA in Hungarian No 2, 1977 signed to press 8 Mar 76 pp 99-100

BENYEDA, J., Dr., Budapest, DRAVAI, G., Dr., Szentes, GAJDACS, G., Dr., Bekescsaba, and LAZAR, I., Mohacs

[Abstract] Since the first appearance of viral diarrhea of swine (TGE) in Hungary, periodic epidemics of this disease have been observed throughout the country. A similar viral disease that has caused economic losses approaching those due to TGE has been noted since 1970, mostly in large farms. Its appearance is often due to the transportation of diseased animals but its cause has not been definitely identified. Epidemiological and serological studies indicated that the immunobiological properties of the causative agent differ from those of the TGE virus. The latent period of the disease ranges from 1 to 3 days. It starts with loss of appetite, followed by diarrhea, and, in 2 to 3 percent of the cases, by vomiting. The most serious cases have been noticed among suckling piglets. No antibodies neutralizing the TGE virus have been found in the blood of the animals after the disease. Because of the danger of an epizootic and the resulting economic loss, occurrences of the disease should be handled as if it were TGE.

USSR

UDC 636.32/38:591.444

CHANGES IN THE FUNCTIONAL STATE OF SHEEPS' THYROID GLAND AS AFFECTED BY
AMMONIUM PERCHLORATE

Moscow DOKLADY VASKHNIL in Russian No 2, Feb 77 pp 33-35

MIKHAYLOV, V. I., candidate of biological sciences, Moscow Veterinary Academy
imeni K. I. Skryabin

[Abstract] Controlling the activity of the thyroid gland is a way of increasing animal productivity. Ammonium perchlorate (AP) has recently been used for this purpose. Nine month old sheep weighing about 35 kilograms each were subjected to 3 series of experiments. For 6 months the animals daily received 2mg of AP per 1 kg of live weight (series I). Then the animals were given a single dose of 100 mg per kg of live weight (series II). After a 45 day halt the animals were given the initial daily dose for 30 days (series III). Their blood was examined for protein-bound iodine and inorganic iodine. The applications of AP resulted in a weakening of thyroid gland activity, as indicated in reductions in the level of protein-bound iodine after 1, 2, and 4 months. The content of cholestrine in the experimental animals increased. After the single dose of AP the hypofunctioning of the thyroid began immediately, while in the normal state it takes place only after 30 days. The reduction in protein-bound iodine indicates the hypofunctional state of the thyroid and the reduction in hormone formation. The amount of iodine in the urine is an indirect indicator of thyroid activity. After 4 months this indicator was about 10% higher in the experimental group. The amount of iodine remaining in the body was about 10% less in the experimental group. The thyroid glands of the experimental animals were 5.9% larger than in the controls and there was a reduction in the content of hormonal and inorganic iodine. Tables 4; references 9 (Russian).

USSR

UDC 636.52/.58:636.084.5

PHASE FEEDING OF PULLETS AND LAYER HENS UNDER CAGE MAINTENANCE CONDITIONS

Moscow DOKLADY VASKHNIL in Russian No 2, Feb 77 pp 28-30

IOTSYUS, G. P., doctor of agricultural sciences, BARANAUSKAS, S. K., candidate of agricultural sciences and VAYSHVILA, A., Lithuanian Agricultural Academy

[Abstract] Problems in differentiated feeding of poultry have not been adequately studied. Most poultry factories feed mixed feeds containing equivalent amounts of metabolic energy, raw protein and other food substances without taking into consideration age-induced changes in bird productivity, physiological condition, and the assimilability of nutrients. Previous studies have shown that it is necessary to change the content of nutrients. These

problems have not been solved and there are diverse recommendations in the literature. During 1972-1975 an experiment was carried out at the Vevisskaya poultry factory in which six variants of feeding replacement birds were studied. The best results were obtained by feeding birds mixed feed containing the following percentages of raw protein: from 1 to 42 days - 22%; from 42 to 98 days - 17%, and from 99 to 154 days 13%. Reducing the quantity of protein in leghorn chickens' diet and maintaining 300 kilocalories of metabolic energy in 100 grams permitted a 9-12% reduction in feed use, an 11-22% reduction in raw protein per 1 kilogram of weight gain, and increased egg production by 7-16%. By the time the birds were 400 days old they were producing 7-13% more eggs than the control. In the 400-500 day old bracket, the quantity of raw protein per 100 grams can be reduced by 15% at a 300 kilocalorie level of metabolic energy. This is because the birds are beginning to accumulate internal fat. As a result of using the phase method of feeding the poultry factory saved 56 tons of protein in 1 year. The eggs from the experimental group were 2.49-3.03% smaller, although they met the requirements made upon I category eggs. The use of this method will not only reduce feed costs but save 7-8% of the protein used for feeding pullets, and 8-9% of that used for layer hens. Tables 4; references 10: 3 Russian, 7 Western.

USSR

UDC 636.2:637.12

EFFECT OF DIFFERENT TERMS OF PREPARING FIRST CALF HEIFERS FOR INCREASING MILK CAPACITY ON THEIR MILK YIELD

Moscow DOKLADY VASKHNIL No 2, Feb 77 pp 25-26

ZALIBEKOV, D. G., candidate of agricultural sciences, Dagestan Scientific Research Institute of Agriculture

[Abstract] During October-November 1973 at the Kirov experimental farm of the DagNIISKH [Dagestan Scientific Research Institute for Agriculture] 49 heifers of the red steppe breed were subjected to different procedures to prepare them for milking. Those in group I (18) were prepared 3.5-4 months prior to calving, in group II (16) 1.5-2 months, and in group III (control. 15) were prepared using the farm's accepted system (10-20 prior to calving). The animals in groups I and II had their udders massaged 3-5 minutes each morning and evening during milking. Feeding conditions for all three groups were the same and a detailed breakdown is given. During the first 3 months prior to lactation there were no sizable differences in weight between animals in the 3 groups. However, after 4 months of lactation the animals in groups II and III were heavier (roughly 5-14.9 kilograms). The animals in group I produced 11.2 kilograms more milk than those in II, and 17.03 than those in III. The difference in milk yield was mainly in the first 3-4 months of lactation and yields for all three groups became more similar later. Outlays for feeding and maintaining the animals in I amounted to 4.1 rubles per head more than for those in II and 7.3 rubles per head more than in III. Each

animal in I produced 23.7 more rubles than in II, and 35.8 more than in III. Additional profit from milk in I was 19.6 rubles more than in II and 28.5 more than in III. Reducing the live weight of the first calf heifers by 43.4 kilograms and later increasing it by 15.8 prior to the fourth month of lactation and by 55.3 kilograms by the end of lactation is the optimal procedure for the replacement herd of this breed. It is thus necessary to substantially change the system of selecting the replacement herd. The following percentage of animals were unsuited to industrial milking techniques: I - 33.4%, II - 37.6%, III - 40.0%. Tables 2; no references.

Publications

USSR

MICROFLORA OF PETROLEUM DEPOSITS (Review of a monograph MIKROFLORA NEFTYANYKH MESTOROZHDENIY by E. P. Roxanova and S. I. Kuznetsov. Nauka press, Moscow, 1974, 196 p)

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 2, Mar/Apr 77 pp 315-316

MURZAYEV, P. M., Reviewer

[Abstract] This is a new monograph issued by the Section on Geological Activity of Microorganisms of the Institute of Microbiology, Academy of Sciences USSR (Director, S. I. Kuznetsov). It differs from earlier issues in that it examines the microflora, not only of a forming bed of petroleum, but also of the surrounding geological environment and stagelike changes of the biogenic processes in artificially-flooded petroleum strata. This has provided a new look at the origin and development of the processes in a deposit and the creation of a unique model of the phenomena which take place in the deposit. Chapter I examines general problems of origin and composition; Chapter II, the distribution of bacteria in a deposit, water layer, and rock; III, biocenosis, biochemistry of organisms, designation of new forms; IV and V concern phenomena appearing in flooding of oil beds, water penetration, and its effect on the microflora. The authors distinguish the microflora of a petroleum deposit according to degree of water exchange, i) with extremely difficult water exchange where the oils are light, enriched with methane, ii) with slightly difficult water exchange where the oils are heavy, tarry, occasionally enriched with sulfur, and iii) with active water exchange where the oil is heavy and pitchy. Some shortcomings in the text are found which do not lessen its overall value. The authors have shown the relationship of microorganism development and the petroleum medium, and its influence on the condition of the petroleum deposit. The text is said to be of interest, even beyond the USSR, to biologists, microbiologists, biogeochemists, geologists, and petroleum workers.

USSR

ALGAE BIOFERTILIZERS AND RICE CULTIVATION (Review of a monograph VODOROSLI-BIOLOGICHESKOYE PLODORODIYE KULTURY RISA, by G. S. Venkataraman.)

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 2, Mar/Apr 77 pp 316-317

GORYUNOVA, S. V., and ORLEANSKIY, V. K., Reviewers

[Abstract] The author, Dr. Venkataram, is a prominent scientist of India, a graduate of Madras and Banaras (doctorate). Since 1956 he has been on the staff of the Indian Agricultural Institute in New Delhi, has worked with A. Watanabe at Tokyo University (on applied microbiology), and with K. Lorentz at Goettingen (West Germany). This appears to be a review of the foreign language (i.e., non-Russian) text of Venkataram, and reflects considerable Soviet interest in this field; this is supported by a review, in this same journal, pp 317-319, of another text by Venkataraman, et al, "Algae--Form and Function" in which review the wish is expressed that that text be translated into Russian. Goryunova and Orleanskiy present a favorable review. They point out the blue-green algae are sources of biostimulators, and growth substances in the soil. Use of the algae in agriculture is said to be increasing but a number of problems limit applications in the USSR. Thus, in many areas of India, rice cultivation is carried out with excessive moisture, whereas, in the USSR, irrigation is employed, and conditions for algae development are more difficult.

USSR

LIFE IN THE DESERT, GEOGRAPHICAL-BIOGEOCOENOTIC AND ECOLOGICAL PROBLEMS (ZHIZN' V PUSTYNE, GEOGRAFO-BIOGEOTSENOTICHESKIYE I ECOLOGICHESKIYE PROBLEMY), a book, published by MYSL', Moscow, 1976, 271 pp, with illustrations and maps

ZALETAYEV, V. S.

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PART II. BEHAVIORAL SCIENCES
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USSR

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WAYS OF DECREASING THE TRAUMATISM OF ELECTRIC WELDERS IN ERECTION OPERATIONS

Moscow MONTAZHNYYE I SPETSIAL'NYYE RABOTY V STROITEL'STVE in Russian No 3,
Mar 77 signed to press 26 Oct 76 p 26

KOTOV, K. K., candidate of technical sciences, NEZHIVOV, A. F., and OKOLELOV, A. N., engineers, and SAFARYAN, S. N., candidate of psychological sciences, Sevkavtekmontazh, Krasnodar branch of the All-Union Scientific Research Institute of Erection and Special Construction Operations

[Abstract] It has been found that whereas electric welders are involved in more than 10% of the total number of accidents occurring in erection operations, only 3.7% of the electric welders have received injuries directly connected with the electrical welding process. An analysis of the accidents revealed that the injuries incurred by electric welders in erection operations are characterized by the same causes as those incurred by erection metal workers. Therefore in order to decrease the traumatism of the electric welders it is necessary, first of all, to attain a decrease in the general danger level of the general erection processes, operations, etc. Specific measures in this respect are recommended. Table 1.

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